Vol. 1016 Number 1

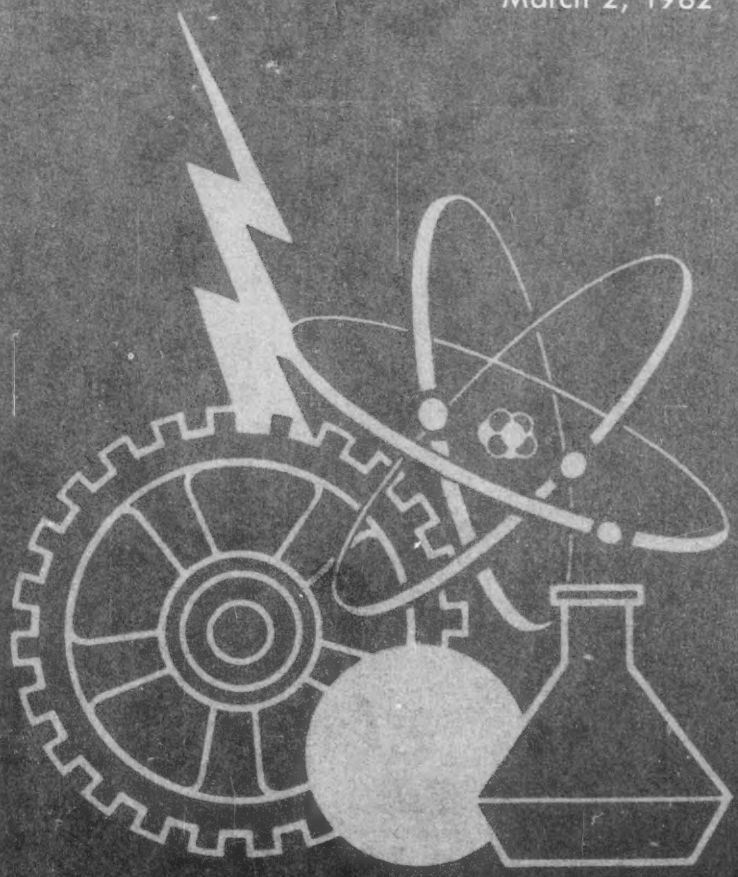
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

March 2, 1982



U.S.
DEPARTMENT
OF COMMERCE

Patent
and
Trademark
Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

March 2, 1982 Volume 1016 Number 1

CONTENTS

	Page
Patent and Trademark Office Notices	
Patent Cooperation Treaty (PCT) Information	1016 OG 2
Reissue Applications Filed	1016 OG 2
Requests for Reexamination Filed	1016 OG 2
Patent Certificates of Correction	1016 OG 3
Disclaimers	1016 OG 3
Dedication	1016 OG 3
Patents Available for Licensing	1016 OG 3
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	1016 OG 7
Condition of Patent Applications	1016 OG 8
Defensive Patent Publication (101,601)	1
Reissue Patents Granted (30,873)	3
Plant Patents Granted (4,828)	5
Patents Granted	
General and Mechanical (4,317,237)	7
Chemical (4,317,657)	147
Electrical (4,317,951)	227
Design Patents Granted (263,175)	309
Index of Patentees	PI 1
Indices of Reissue, Design and Plant Patentees	PI 33
Index of Applicants of Defensive Publications	PI 35
Classification of	
Patents (Including Reissues)	PI 37
Designs, Plants and Defensive Publications	PI 39
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 40
Designs, Plants and Applicants of Defensive Publications	PI 41
Change of Address Form and Subscription Order Form	Back Page

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly, subscription $360.00 per annum for first-class mailing, also available as fourth-class mail at $250.00 domestic; $312.50 foreign; foreign first-class mailing rates will be furnished upon request; single copies each, $6.50 domestic, $8.15 foreign.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly, subscription $115.00 per annum, foreign mailing $143.75 per annum; single copies $3.75 each domestic, $4.10 foreign.

GENERAL INFORMATION concerning PATENTS, price $2.50 each.

GENERAL INFORMATION concerning TRADEMARKS, price $2.00 each.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at 50 cents each; PLANT PATENTS in color, $1.00 each; copies of TRADEMARKS AND DESIGN PATENTS at 20 cents each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT member countries and the most recent PCT rule changes see the notices appearing in the Official Gazette at 1001 O.G. 14 on Dec. 9, 1980 and at 1012 O.G. 20 on Nov. 17, 1981.

Note that the international fees have been increased as of Jan. 1, 1982. The current schedule of fees is as follows:

Transmittal fee	$ 35.00
Search fee	300.00
International Fees	
Basic Fee (first 30 pages)	270.00
Basic Supplemental Fee (for each sheet over 30)	6.00
Designation Fees	65.00

GERALD J. MOSSINGHOFF,
Jan. 19, 1982. *Commissioner of Patents and Trademarks.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,078,726, Re. S.N. 327,398, Filed Dec. 4, 1981, Cl. 239/2.01, LAWN SPRINKLER, Joseph J. Walto, Owner of Record: *The Toro Co., Minneapolis, Minn.,* Attorney or Agent: James W. Miller, et al., Ex. Gp.: 313

4,178,480, Re. S.N. 328,745, Filed Dec. 8, 1981, Cl. 370/50, SIGNAL MULTIPLEXING CIRCUIT, Robert L. Carbrey, Owner of Record: *Inventor,* Attorney or Agent: S. E. Hollander, et al., Ex. Gp.: 236

4,261,988, Re. S.N. 326,649, Filed Dec. 2, 1981, Cl. 424/244, CHROMANONE DERIVATIVES, Arno Widdig, et al., Owner of Record: *Bayer Aktiengesellschaft, Leverkusen, Germany,* Attorney or Agent: Arnold Sprung, et al., Ex. Gp.: 125

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

3,337,331, Reexam. No. 90/000,150, Requested: Jan. 28, 1982, Cl. 75/128, CORROSION RESISTANT STEEL ALLOY, Lars Gustaf Fredrik Ljungberg, Owner of Record: *Santrade, Ltd., Lucerne, Switzerland,* Attorney or Agent: Ronald L. Grudziecki, Ex. Gp.: 110, Requester: Santrade, Ltd., Lucerne, Switzerland

3,459,353, Reexam. No. 90/000,151, Requested: Jan. 28, 1982, Cl. 226/132, ADJUSTABLE LENGTH SHEET DISPENSER, Milford J. Taylor, Owner of Record: *Erving Paper Mills, Erving, Mass.,* Attorney or Agent: Arthur F. Dionne, Ex. Gp.: 240, Requester: Erving Paper Mills, Erving, Mass.

3,517,899, Reexam. No. 90/000,144, Requested: Jan. 27, 1982, Cl. 186/40, UNITIZED AIRCRAFT FOOD AND BEVERAGE SERVICE, Richard L. Vernon, Owner of Record: *Lockheed Corp., Burbank, Calif.,* Attorney or Agent: Victor A. DiPalma, Ex. Gp.: 310, Requester: Lockheed Corp., Burbank, Calif.

3,527,010, Reexam. No. 90/000,145, Requested: Jan. 26, 1982, Cl. 52/397, BUILDING WALL CONSTRUCTION, Kazimierz J. Brzezinski, Owner of Record: *Kawneer Co., Inc., Niles, Mich.,* Attorney or Agent: Clemens Huffman, Ex. Gp.: 350, Requester: The Anaconda Corp., Denver, Colo.

3,848,303, Reexam. No. 90/000,148, Requested: Jan. 27, 1982, Cl. 407/77, CUTTING INSERT AND CUTTING TOOL ASSEMBLY, Kurt Heinrich Albert Erich Faber, Owner of Record: *Sandviken Jernverks Aktiebolag, Sandviken, Sweden,* Attorney or Agent: Ralph E. Parker, Ex. Gp.: 324, Requester: Sandvik Aktiebolag c/o Ronald L. Grudziecki, Alexandria, Va.

4,116,718, Reexam. No. 90/000,152, Requested: Feb. 1, 1982, Cl. 136/246, PHOTOVOLTAIC ARRAY INCLUDING LIGHT DIFFUSER, J. W. Yerkes, et al., Owner of Record: *Atlantic Richfield Co., Los Angeles, Calif.,* Attorney or Agent: Roderick W. Macdonald, Ex. Gp.: 116, Requester: Bruno J. Verbeck, San Diego, Calif.

4,272,684, Reexam. No. 90/000,147, Requested: Jan. 26, 1982, Cl. 250/578, OPTICAL BEAM-SPLITTING ARRANGEMENTS ON OBJECT SIDE OF A LENS, Ned J. Seachman, Owner of Record: *Xerox Corp., Stamford, Conn.,* Attorney or Agent: Joseph R. Sakmyster, Ex. Gp.: 250, Requester: Xerox Corp., Stamford, Conn.

PATENT NOTICES

Certificates of Correction for the Week of Mar. 2, 1982

Des. 257,603	4,264,399	4,287,193	4,293,898
3,959,322	4,266,936	4,287,569	4,294,208
3,985,741	4,267,853	4,288,239	4,294,458
4,172,898	4,270,831	4,288,529	4,294,606
4,202,864	4,271,968	4,288,619	4,294,651
4,204,922	4,273,802	4,288,955	4,295,503
4,205,070	4,274,113	4,289,431	4,295,682
4,205,610	4,275,444	4,289,534	4,296,000
4,216,280	4,275,583	4,289,562	4,296,156
4,224,415	4,277,745	4,289,635	4,296,405
4,225,492	4,278,451	4,289,770	4,296,473
4,231,071	4,278,756	4,289,892	4,297,234
4,231,877	4,278,915	4,290,439	4,297,528
4,242,520	4,279,620	4,290,504	4,297,569
4,243,231	4,280,846	4,290,904	4,297,581
4,244,631	4,281,319	4,291,172	4,298,313
4,244,918	4,282,007	4,291,394	4,298,364
4,244,977	4,282,403	4,291,653	4,298,472
4,246,169	4,282,829	4,291,880	4,298,521
4,250,113	4,283,302	4,292,081	4,298,614
4,251,452	4,283,957	4,292,623	4,298,752
4,251,484	4,284,280	4,292,640	4,298,800
4,251,559	4,284,874	4,292,651	4,298,820
4,253,963	4,285,108	4,292,970	4,299,038
4,256,057	4,285,824	4,292,971	4,299,091
4,258,294	4,286,336	4,293,193	4,299,119
4,259,326	4,287,005	4,293,343	
4,263,157	4,287,006	4,293,556	
4,263,555	4,287,064	4,293,568	

Disclaimers

3,819,170.—*Howard Ray Longbrake,* Grafton, Ohio. PORTABLE SHARPENER. Patent dated June 25, 1974. Disclaimer filed Nov. 18, 1981, by the inventor.

Hereby enters this disclaimer to claim 1 of said patent.

4,161,471.—*Robert James Kassal,* Wilmington, Del. ELASTOMER MODIFIED UNSATURATED MOLDING COMPOSITIONS. Patent dated July 17, 1979. Disclaimer filed Nov. 12, 1981, by the assignee, *E. I. du Pont de Nemours and Co.*

Hereby enters this disclaimer to claims 1–8 of said patent.

4,276,649.—*Gradus C. Groenendaal* and *Einar A. Aagaard,* Eindhoven, Netherlands. RECEIVER FOR DIGITAL SIGNALS IN LINE CODE. Patent dated June 30, 1981. Disclaimer filed Dec. 14, 1981, by the assignee, *U.S. Philips Corp.*

Hereby enters this disclaimer to all of the claims of said patent.

4,277,454.—*Gary L. Long* and *Roger B. Humberger,* Pocatello, Id. METHODS FOR THE CONTROL OF EXCESSIVE CORROSION IN PHOSPHORIC ACID CIRCUITS. Patent dated July 7, 1981, Disclaimer filed Dec. 21, 1981, by the assignee, *J. R. Simplot Co.*

Hereby enters this disclaimer to claims 7 and 17 of said patent.

Dedication

4,094,217.—*Roger Edsel Exline,* Parkersburg, W. Va. SAFETY SLITTER FOR THERMOPLASTIC SHEET. Patent dated June 13, 1978. Dedication filed Dec. 17, 1981, by the assignee, *Borg-Warner Chemicals, Inc.*

Hereby dedicates to the Public the remaining term of said patent.

Patents Available for Licensing or Sale

4,299,268. AUTOMATICALLY CONTROLLED CASTING PLANT. *James A. Olif, Stevens, Davis, Miller & Mosher,* 1911 Jefferson Davis Hwy., Suite 600, Crystal Mall 1, Arlington, Va. 22202. 703-920-8900.

4,287,621. STEERING WHEEL ATTACHMENT. *Charles A. Kertz.* Corres. to Nathaniel A. Humphries, Mason, Fenwick & Lawrence, 1730 Rhode Island Ave., N.W. Washington, D.C. 20036. (202) 293-2010.

4,280,078. "Magnetron" is available for license or sale. Please direct inquiries to *W. G. Fasse,* P.O. Box K. St. Albans, Me. 04971-0133.

4,299,045. BACKPLATE FOR A DETACHABLE STEAM LOCK. *Ramon H. Cervates,* 4600 78th St., Sacramento, Calif. 95820.

4,303,411. METHOD AND APPARATUS FOR COMPRESSIVELY SEPARATING WASTE MATERIAL. *Eugene M. Baikff.* Correspondence to: Bovard & Cie, Optingenstrasse 16, CH-Berne 25 SWITZERLAND.

4,136,764. MOTHER ALICE'S BREAD VENDING MACHINE. *Alice Johnson,* 8650 Belford Ave., Los Angeles, Calif. 90045.

The following patents are offered by Samson Helfgott, 611 Caffrey Ave., Far Rockaway, N.Y. 11691.

3,949,511. KEY HOLDERS FOR INSTANT FISHING. *Morris Goldhaft.*

4,049,165. CASE AND CLOSURE CAP. *Morris Goldhaft.*

4,283,018. SHREDDING ACCESSORY FOR A ROTARY MOWER. *Alyre J. Richard,* 521 Knox St., Rumford, Me. 04276.

4,300,751. FLODABLE AND HEIGHT ADJUSTABLE OVERHEAD LIFT. *Bennie F. Delaney,* P.O. Box 894, Jacksonville, Tex.

3,748,898. METHOD AND APPARATUS RELATED TO THE TESTING OF HYDRAULIC CIRCUITS. Corres to : *Neil F. Greenblum, Sandlers & Greenblum,* 701 South 23rd St., Arlington, Va. 22202. 703-521-7800.

American Hospital Supply Corp. is prepared to grant non-exclusive licenses under the following patents to parties newly entering into the manufacture and/or assembly and sale of disposable blood pressure monitoring equipment. Applications for licenses and license terms should be addressed to:

Lyman E. Lance, President
American Pharmaseal Medical/Surgical Division
American Hospital Supply Corp.
1015 Grandview Ave.
Glendale, Calif. 91209.

4,267,833. METHOD OF FLUSHING A MEDICAL FLUID.

4,267,834. SYSTEM FOR FLUSHING A MEDICAL FLUID.

4,267,835. MEDICAL FLUSHING VALVE.

4,280,572. CHISEL FOR A PERCUSSIVE TOOL. *Salzgitter Maschinen und Anlagen,* Aktiengesellschaft Salzgitter, Federal Republic of Germany. Correspondence to: Michael J. Striker, 360 Lexington Ave., New York, N.Y. 10017.

D-259,271. CURLING STONE. *Richard A. Kushnir,* 19791 Cambridge La. Huntington Beach, Calif. 92646.

4,302,513. ELASTIC TYPING MEDIUM FOR REDUCTION OF MESSAGE SIZE. *David E. Russell,* 110 Riverside Ave., Jacksonville, Fla. 32202.

The General Electric Co. is prepared to grant non-exclusive licenses under the following patents upon reasonable terms to domestic manufacturers.

Applications for license may be addressed to Patent Counsel, Gas Turbine Division, General Electric Co., 1 River Rd., Bldg. 500, Room 218, Schenectady, N.Y. 12345.

4,299,088. CYCLIC LOD DUTY CONTROL FOR GAS TURBINE.

Application for license may be addressed to:

Division Patent Counsel
Power Delivery Division
General Electric Co.
6901 Elmwood Ave.
Philadelphia, Pa. 19142.

4,224,490. FLUID BLAST CIRCUIT BREAKER.

Applications for license may be addressed to Patent Counsel, Gas Turbine Division, General Electric Co., 1 River Rd., Bldg. 500, Room 218, Schenectady, N.Y. 12345.

4,297,842. NOx SUPPRESSANT STATIONARY GAS TURBINE COMBUSTOR.

Applications for licenses may be addressed to: Patent Counsel, Distribution Equipment Division, General Electric Co., P.O. Box 148, Hartford, Conn. 06141-0148.

4,301,346. CIRCUIT BREAKER TRIP LATCH ASSEMBLY.

4,301,433. CIRCUIT BREAKER ELECTRICAL CLOSURE CONTROL APPARATUS.

4,301,434. UNDELVOLTAGE RELEASE RESET AND LOCKOUT APPARATUS.

4,301,436. CIRCUIT BREAKER HOOK APPARATUS.

4,308,438. SAFETY CUT-OUT FOR MOTOR VEHICLES, *Roland Rossel,* Correspondence to: Stevens, Davis, Miller & Mosher, 1911 Jefferson Davis Hwy., Suite 600, Crystall Mall 1, P.O. Box 2627, Arlington, Va. 22202, Attn: James A. Oliff.

The RCA Corp. offers to grant non-exclusive licenses on reasonable terms and conditions under the patents listed below. Inquiries respecting licenses under RCA patents should be addressed to RCA Corp., Sr. Vice-President, Licensing, 30 Rockefeller Plaza, New York, N.Y. 10020.

4,303,341. OPTICALLY TESTING THE LATERAL DIMENSIONS OF A PATTERN.

4,303,893. FREQUENCY SYNTHESIZER INCORPORATING DIGITAL FREQUENCY TRANSLATOR.

4,303,907. LOW POWER SWITCH CLOSURE SENSING CIRCUIT.

4,303,939. HORIZONTAL STABILITY MEASUREMENT APPARATUS.

4,304,983. PLASMA ETCHING DEVICE AND PROCESS.

4,305,023. RASTER DISTORTION CORRECTED DEFLECTION CIRCUIT.

4,305,044. AMPLIFIER CIRCUIT HAVING CONTROLLABLE GAIN.

4,305,055. TELEVISION DISPLAY SYSTEM INCORPORATING A COMA CORRECTED DEFLECTION YOKE.

4,305,081. MULTILAYER RECORD BLANK FOR USE IN OPTICAL RECORDING.

4,305,086. MNOS MEMORY DEVICE AND METHOD OF MANUFACTURE.

4,305,145. SPINDLE RETRACTING MECHANISM FOR DISC RECORD PLAYER.

4,305,146. DISC PLAYER HAVING DISC STABILIZING APPARATUS.

4,305,291. GAS ADSORPTION APPARATUS FOR DETERMINING THE GASEOUS SURFACE AREA OF A MATERIAL.

4,305,725. METHOD OF AND APPARATUS FOR OUTGASSING RAW MATERIAL USED TO GROW CRYSTALS.

4,305,791. METHOD FOR THE MANUFACTURE OF CAPACITIVE ELECTRONIC DISCS.

4,305,795. METHOD FOR THE MANUFACTURE OF STAMPERS.

4,305,972. METHOD FOR EXPEDITIOUSLY PROCESSING A SODIUM-POTASSIUM-CESIUM-ANTIMONY PHOTOCATHODE.

4,306,013. ASYMMETRICAL RADIATION EXPOSURE OF SPIN COATED PHOTORESIST TO OBTAIN UNIFORM THICKNESS COATING USED TO REPLICATE SPIRAL GROOVES IN PLASTIC SUBSTRATE.

4,306,171. FOCUSING STRUCTURE FOR PHOTOMULTIPLIER TUBES.

4,306,188. PHOTOMULTIPLIER TUBE HAVING A PHOTOCURRENT COLLECTOR.

4,306,236. RANGING RADAR INCLUDING A MODULATING REFLECTOR.

4,306,256. PREEMPHASIS AND CLIPPING APPARATUS FOR REDUCING DISTORTIONS.

4,306,308. SYMBOLS COMMUNICATION SYSTEM.

4,306,704. SELF-HEATED SOLENOID.

4,307,306. IC CLAMPING CIRCUIT.

4,307,347. ENVELOPE DETECTOR USING BALANCED MIXER.

4,307,363. PERMEABLE CORRECTOR FOR DEFLECTION YOKES.

4,307,411. NONVOLATILE SEMICONDUCTOR MEMORY DEVICE AND METHOD OF ITS MANUFACTURE.

4,307,418. VIDEO DISC PLAYER SYSTEM FOR CORRELATING STYLUS POSITION WITH INFORMATION PREVIOUSLY DETECTED FROM DISC.

4,307,419 VIDEO DISC SIGNAL SURFACE IMAGING APPARATUS.

4,307,467. CONTINUOUS TUNING ARRANGEMENT FOR A MULTIBAND TELEVISION RECEIVER.

4,307,549. SKYLIGHT COVER.

4,308,337. UNIFORM LIGHT EXPOSURE OF POSITIVE PHOTORESIST FOR REPLICATING SPIRAL GROOVE IN PLASTIC SUBSTRATE.

4,308,484. FRONTPLATE AND SHADOW MASK ASSEMBLIES FOR A MODULAR FLAT PANEL DISPLAY DEVICE.

4,308,486. LINE CATHODE STRUCTURE HAVING RECESSED GEOMETRY.

4,308,498. KELVIN TEST FIXTURE FOR ELECTRICALLY CONTACTING MINIATURE, TWO TERMINAL, LEADLESS, ELECTRICAL COMPONENTS.

4,308,500. INCREMENTAL ENCODER FOR MEASURING POSITIONS OF OBJECTS SUCH AS ROTATING SHAFTS.

4,308,557. VIDEO DISC SYSTEM.

4,292,861. EARTH SELF-ORIENTING APPARATUS.

4,292,960. APPARATUS AND METHOD FOR APPLICATION OF RADIOACTIVE AND MICROWAVE ENERGY TO THE BODY.

4,293,212. THERMAL PROCESSOR IN AN APPARATUS FOR DEVELOPING PHOTOGRAPHIC FILM.

4,293,791. COLOR PICTURE TUBE HAVING IMPROVED CORRUGATED APERTURED MASK.

4,293,792. COLOR PICTURE TUBE HAVING IMPROVED SLIT TYPE SHADOW MASK.

4,293,803. VERTICAL DEFLECTION CIRCUIT.

4,293,856. DIGITAL CFAR SIGNAL PROCESSOR FOR PHASE CODED RADARS.

4,293,870. CIRCUIT ARRANGEMENT FOR MULTIPLEXING AN INPUT FUNCTION AND AN OUTPUT FUNCTION AT A SINGLE TERMINAL.

4,294,321. POSITION SENSING AND DISPLAY MEANS.

4,295,065. LEVEL SHIFT CIRCUIT.

4,295,074. MERCURY ARC LAMP HAVING COMMUNICATING MERCURY RESERVOIR.

4,295,077. CIRCUMFERENTIALLY APERTURED CYLINDRICAL GRID FOR ELECTRON TUBE.

4,295,078. COLOR TELEVISION RECEIVER DEGAUSSING CIRCUIT.

4,295,088. TEMPERATURE-SENSITIVE VOLTAGE DIVIDER.

4,295,098. DIGITALLY ADJUSTABLE PHASE SHIFTING CIRCUIT.

4,295,101. CLASS AB PUSH-PULL QUASI-LINEAR AMPLIFIERS.

4,295,107 IMPEDANCE TRANSFORMATION NETWORK.

4,295,144. FEED SYSTEM FOR A CIRCULARLY POLARIZED TETRA-COIL ANTENNA.

4,295,151. METHOD OF BONDING TWO PARTS TOGETHER AND ARTICLE PRODUCED THEREBY.

4,295,160. SIGNAL PROCESSING CIRCUIT HAVING A NON-LINEAR TRANSFER FUNCTION.

4,295,161. KEYED NOISE FILTER IN A TELEVISION RECEIVER.

4,295,163. KEYING SIGNAL GENERATOR RESPONSIVE TO PLURAL INPUT SIGNALS.

4,295,166. FAILURE COMPENSATED AUTOMATIC KINESCOPE BEAM CURRENT LIMITER.

4,295,216. APPARATUS FOR MEASURING THE CHARACTERISTICS OF A WIDEBAND ELECTROMECHANICAL RECORDING SYSTEM HAVING A TRANSFORMER.

4,295,266 METHOD OF MANUFACTURING BULK CMOS INTEGRATED CIRCUITS.

4,295,621. SOLAR TRACKING APPARATUS.

4,296,144. ION IMPLANTED STYLUS.

4,296,189. COLOR PICTURE TUBE HAVING IMPROVED SLIT TYPE SHADOW MASK AND METHOD OF MAKING SAME.

4,296,272. COMPOSITE SUBSTRATE.

4,296,359. TELEVISION DISPLAY ERROR CORRECTION.

4,296,370. METHOD OF DETETING A THIN INSULATING FILM OVER A CONDUCTOR.

4,296,371. SYSTEM FOR MEASURING STYLUS SHOE LENGTH.

4,296,382. CLASS AB PUSH-PULL FET AMPLIFIERS.

4,296,430. MAGNETIC RECORDING WITH REDUCED CROSS-TALK AND INTERCHANNEL TIME DISPLACEMENT.

4,296,446. MOTOR SPEED CONTROL CIRCUIT.

4,296,478. READOUT OF ELECTROSTATICALLY STORED INFORMATION.

4,297,095. FILAMENT WINDING APPARATUS.

4,297,149. METHOD OF TREATING SIPOS PASSIVATED HIGH VOLTAGE SEMICONDUCTOR DEVICE.

4,297,312. METHOD FOR PREPARING STYLUS LAPPING DISCS.

4,297,393. METHOD OF APPLYING THIN METAL DEPOSITS TO A SUBSTRATE.

4,297,641. SERRODYNING SYSTEM EMPLOYING AN ADJUSTABLE PHASE SHIFTING CIRCUIT.

4,296,644. AMPLIFIER WITH CROSS-OVER CURRENT CONTROL.

4,297,706. CIRCULARLY POLARIZED SLOTTED PYLON ANTENNA.

4,297,719. ELECTRICALLY PROGRAMMABLE CONTROL GATE INJECTED FLOATING GATE SOLID STATE MEMORY TRANSISTOR AND METHOD OF MAKING SAME.

4,297,726 TELEVISION RECEIVER CHASSIS ADAPTED TO BE COMPATIBLE WITH DIFFERENT TUNER AND CABINET CONFIGURATIONS.

4,298,818. ELECTRON GUN.

4,298,819 BEAM CLEAN UP STRUCTURE FOR FLAT PANEL DISPLAY DEVICES.

4,298,829. POWER SUPPLY AND DEFLECTION CIRCUIT WITH RASTER SIZE COMPENSATION.

4,298,830. HORIZONTAL DEFLECTION GENERATOR AND DRIVER CIRCUIT.

4,298,892. SWITCHING REGULATOR WITH INDEPENDENT FEEDBACK PATH FILTER.

4,298,982. FAULT-TOLERANT INTERFACE CIRCUIT FOR PARALLEL DIGITAL BUS.

4,299,736. CONDUCTIVE MOLDING COMPOSITION AND DISCS THEREFROM.

4,299,910. WATER-BASED PHOTORESISTS USING STILBENE COMPOUNDS AS CROSSLINKING AGENTS.

4,300,039. INCREMENTAL ENCODER.

4,300,069. COLOR PICTURE TUBE HAVING IMPROVED SLIT TYPE SHADOW MASK AND METHOD OF MAKING SAME.

4,300,070 CATHODE-RAY TUBE SCREEN BORDER IMPROVEMENT.

4,300,091 CURRENT REGULATING CIRCUITRY.

4,300,143. THIN PROTECTIVE OVERCOAT LAYER FOR OPTICAL VIDEO DISC.

4,300,226. COMPENSATION APPARATUS FOR A SERVO SYSTEM WITH PERIODIC COMMAND SIGNALS.

4,300,227. REPLICABLE OPTICAL RECORDING MEDIUM.

4,300,811. III-V DIRECT-BANDGAP SEMICONDUCTOR OPTICAL FILTER.

4,301,394. HORIZONTAL DEFLECTION CIRCUIT AND POWER SUPPLY WITH REGULATION BY HORIZONTAL OUTPUT TRANSISTOR TURN-OFF DELAY CONTROL.

4,301,430. U-SHAPED IRIS DESIGN EXHIBITING CAPACITIVE REACTANCE IN HEAVILY LOADED RECTANGULAR WAVEGUIDE.

4,301,458. ANTENNA ARRAY WITH IMPEDANCE MATCHING USING MUTUAL COUPLING.

4,301,495. PRINTED CIRCUIT BOARD SUPPORT STRUCTURE.

4,301,976. TAPE CARTRIDGE.

4,302,063. METHOD FOR VAPORIZING GETTER MATERIAL IN A VACUUM ELECTRON TUBE.

4,302,175. APPARATUS FOR MOLDING RECORDED DISCS.

4,302,273. ETCHING TANK IN WHICH THE SOLUTION CIRCULATES BY CONVECTION.

4,302,498. LAMINATED CONDUCTING FILM ON AN INTEGRATED CIRCUIT SUBSTRATE AND METHOD OF FORMING THE LAMINATE.

4,302,718. REFERENCE POTENTIAL GENERATING CIRCUITS.

4,302,725. METHOD FOR TESTING PANEL-TO-FUNNEL SEALING LAYER OF A CATHODE-RAY TUBE.

4,302,792. TRANSISTOR PROTECTION CIRCUIT.

Request for Removal of Patents

The General Electric Co., a corporation of the State of New York, is owner by assignment of the following patents which were published in the Official Gazette as available for domestic manufacturers' non-exclusive licenses on the dates indicated:

3,908,068. FIRE-RETARDING SYSTEM FOR POLYMERIC COMPOSITIONS, AND A METHOD AND PRODUCTS COMPRISING THE SAME published - May 18, 1976.

4,022,945. ELECTRIC CONDUCTOR PRODUCT HAVING A FLAME RESISTANE INSULATION published - June 26, 1979.

4,069,190. HEAT RESISTANT ETHYLENT-PROPYLENE RUBBER AND INSULATED CONDUCTOR THEREOF published June 26, 1979.

4,125,509. FLAME AND HEAT-RESISTANT ETHYLENT-PROPYLENE RUBBER published June 26, 1979.

General Electric Co. Respectfully Requests that these Patents be Removed from the Register.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 573-5152 Ext. 222
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6552
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214, 215
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7814
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

**Call only between the hours of 10:00 a.m. and 5:00 p.m.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF January 9, 1982

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	6-23-80
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	12-18-79
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	3-02-81
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	11-14-80
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	10-06-80
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	5-20-80
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	6-26-80
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—VACANT ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	3-24-80
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling.	12-07-79
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	10-02-79
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	4-18-80
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	5-07-80
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director ... Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	6-17-80
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	3-17-80
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	10-22-79
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	3-17-80

Expiration of patents: The patents within the range of numbers indicated below expire during January 1982, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,163,865 to 3,167,777, inclusive

Plant Patents ..... Numbers 2,465 to 2,467 inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED MARCH 2, 1982

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T101,601

CYAN DYE-FORMING COUPLERS

Philip T. S. Lau, c/o Kodak Park Works, Rochester, N.Y. 14650

Division of Ser. No. 168,831, Jul. 10, 1980, which is a continuation-in-part of Ser. No. 85,140, Oct. 15, 1979, abandoned. This application Jul. 6, 1981, Ser. No. 280,594

Int. Cl.[3] **C07C** *39/04*

U.S. Cl. 568—716

No Drawing. 28 Pages Specification

Novel phenolic cyan dye-forming couplers contain in the 2-position a p-cyanophenylureido group. These couplers are useful in photographic emulsions, elements and processes.

DEFENSIVE PUBLICATIONS

REISSUES

MARCH 2, 1982

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,873
HINGE STRUCTURES

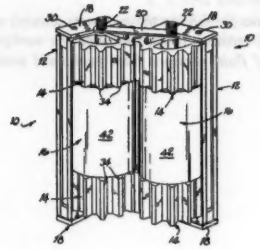
Anthony C. Worrallo, 15 Sprott Rd., Auckland 5, New Zealand

Original No. 4,056,985, dated Nov. 8, 1977, Ser. No. 659,124, Feb. 18, 1976. Application for reissue Jun. 28, 1979, Ser. No. 52,975

Claims priority, application New Zealand, Feb. 21, 1975, 176729

Int. Cl.³ E05D *7/00*

U.S. Cl. 16—354 11 Claims



10. A hinge structure comprising

a first component comprising

a first base element, and

a first gear segment having a first axis of rotation, and

first coupling means for non-rotatably attaching said first base element and said first gear segment so that said first gear segment may slide relative to said first base element in a direction parallel to said first axis while preventing relative movement perpendicular to said first axis to permit adjustment of the position of said first gear segment on said first base element;

a second component comprising

a second base element, and

a second gear segment having a second axis of rotation, said second gear segment meshing with said first gear segment, and

second coupling means for non-rotatably attaching said second base element and said second gear segment so that said second gear segment may slide relative to said second base element in a direction parallel to said second axis while preventing relative movement perpendicular to said second axis to permit adjustment of the position of said second gear segment on said second base element;

a swinging link having first and second ends;

first axle means pivotally connecting said first end of said link to said first gear segment for swinging motion relative to said first gear segment about said first axis of rotation; and

second axle means pivotally connecting said second end of said link to said second gear segment of swinging motion relative to said second gear segment about said second axis of rotation.

Re. 30,874
QUATERNARY AMMONIUM COMPOUNDS IN PRETREATMENT OF HAIR BEFORE SHAMPOOING WITH AN ANIONIC SHAMPOO

George F. Dasher, Inverness; Kathleen A. O'Cull, North Lake, and Thomas J. Schamper, Chicago, all of Ill., assignors to Alberto-Culver Company, Melrose Park, Ill.

Original No. 3,980,091, dated Sep. 14, 1976, Ser. No. 538,891, Jan. 6, 1975. Application for reissue Dec. 31, 1979, Ser. No. 108,899

Int. Cl.³ A45D *7/00*

U.S. Cl. 132—7 22 Claims

1. A method of treating hair to improve the manageability thereof, which comprises initially contacting the hair with a dilute aqueous composition containing a water-soluble quaternary ammonium compound containing at least one long chain alkyl radical attached to the central nitrogen atom thereof, and then shampooing the hair with an anionic shampoo.

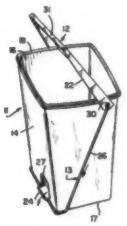
Re. 30,875
FOOT OPERATED CONTAINER AND CLOSURE DEVICE

Howard A. Anderson, Pittsburgh, Pa., assignor to Cities Service Company, Tulsa, Okla.

Original No. 4,150,764, dated Apr. 24, 1979, Ser. No. 933,397, Aug. 14, 1978. Application for reissue Apr. 23, 1980, Ser. No. 142,950

Int. Cl.³ B65D *43/26*

U.S. Cl. 220—263 8 Claims



1. A three element receptacle for receiving material comprising: a *stackable* container[,] *having an opening;* a closure *pivotally and detachably mounted on the opening;* and [an] *a substantially U-shaped* operating member[, said elements being manually separable, said container having an opening formed with a continuous peripheral beaded rim, the continuity of said rim being interrupted by a pair of opposed depressions defining bearings, said closure carrying arcuate tabs mating with and rotatable within said bearings, said closure being further formed with a channel operable to mate with said beaded rim to keep said closure in register when said closure is in the closed position, said closure being still further formed with slots operable to mate with said beaded rim to keep said closure in register when said closure is in the open position, said operating member being formed with a treadle and removable and rotatably mounted to said closure at a location spaced from said arcuate tabs effective to develop a lever arm so that upon operation of said treadle, said closure is pivoted from a closed position to an open position.] *straddling the container and being rotatably mounted on the closure; wherein the walls of the container which define the opening has a bearing surface upon which the closure is pivoted; wherein the closure has an element which mates with the bearing surface when the closure is pivoted; and*

wherein the operating member can be actuated to cause the closure to pivot on the bearing surface to open and/or close the container.

Re. 30,876

JACKING ASSEMBLY

Jack B. Caisley, 99 Swift St., Ballina, NSW 2480, Australia

Original No. 4,056,256, dated Nov. 1, 1977, Ser. No. 683,142, May 4, 1976. Application for reissue Oct. 10, 1979, Ser. No. 83,729

Claims priority, application Australia, May 5, 1975, PC1474; May 5, 1975, PC1475; May 5, 1975, PC1477; Feb. 27, 1976, PC5029

Int. Cl.³ B66F *1/00*

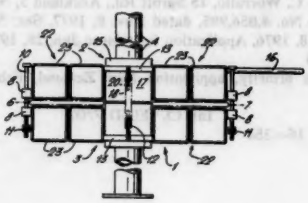
U.S. Cl. 254—106 **16 Claims**

18. A fluid operated jacking assembly suitable for moving a load, in steps, axially of an elongate member having a substantially constant cross section, the assembly comprising:

said elongate member, two parts adapted to be slidably mounted at axially spaced positions on the member;

pawl devices mounted on each of said parts and engagable with the elongate member in a way which permits relative axial movement in one direction only between the elongate member and said parts;

fluid-pressure operated means for forcibly separating the two parts in response to admission of a pressurised fluid to said means during a working stroke, said means comprising at least one inflatable bag located between and in contact with the two parts and, in operation of the jacking assembly, adjacent the elongate member, the bag being flexible but non-elastic so that the area of contact of the bag with the two parts diminishes progressively with increasing admission of pressurised fluid and consequential dilation of the bag, and



recover means for forcing the two parts towards one another to execute a recovery stroke following the working stroke, and release of fluid pressure from said fluid pressure operated means.

PLANT PATENTS

GRANTED MARCH 2, 1982

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,828

VARIEGATED LEMON TREE

Milton K. Harjung, and Cameron Harjung, both of 5644 Durango Rd., Riverside, Calif. 92506

Filed Jan. 10, 1980, Ser. No. 111,112

Int. Cl.³ A01H *5/03*

U.S. Cl. Plt.—45 **1 Claim**

1. A new and distinct variety of variegated lemon tree characterized particularly by the variety of colors and the color patterns displayed by the leaves, fruit and wood thereof.

PLANT PATENTS

(GRANTED MARCH 2, [illegible])

PATENTS

GRANTED MAR. 2, 1982

ERRATA

For CLASS	See PATENT NO.
425–112	4,317,420
376–272	4,317,702
521–159	4,317,752
524–504	4,317,753
525–501	4,317,754
524–276	4,317,755
524–607	4,317,756
524–541	4,317,757
524–202	4,317,758
524–093	4,317,759
524–111	4,317,760
524–141	4,317,761
523–203	4,317,762
523–144	4,317,763
524–449	4,317,764
523–204	4,317,765
524–101	4,317,766
524–102	4,317,767
524–099	4,317,768
524–117	4,317,769
524–500	4,317,895

PATENTS

GRANTED MAR. 2, 1982

ERRATA

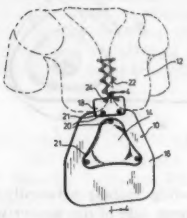
Pat. No.	Title
4,317,102	[illegible]
4,317,103	[illegible]
4,317,104	[illegible]
4,317,105	[illegible]
4,317,106	[illegible]
4,317,107	[illegible]
4,317,108	[illegible]
4,317,109	[illegible]
4,317,110	[illegible]
4,317,111	[illegible]
4,317,112	[illegible]
4,317,113	[illegible]
4,317,114	[illegible]
4,317,115	[illegible]
4,317,116	[illegible]
4,317,117	[illegible]
4,317,118	[illegible]
4,317,119	[illegible]
4,317,120	[illegible]

PATENTS

GRANTED MARCH 2, 1982

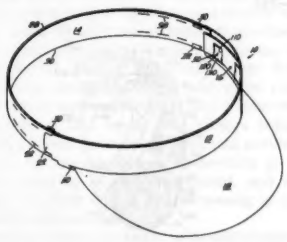
GENERAL AND MECHANICAL

4,317,237
CHEST PROTECTOR
Allen L. Porte, Acton, Canada, assignor to Hughie Big Canoe, Acton, Canada
Filed Apr. 18, 1980, Ser. No. 141,708
Claims priority, application Canada, Sep. 20, 1979, 336054
Int. Cl.³ A41D *13/00*
U.S. Cl. 2—2 **8 Claims**



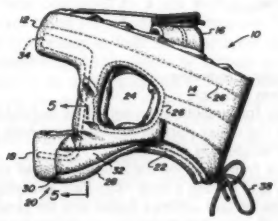
1. A chest protector for use in combination with shoulder harness comprising an outer sheet of rigid, form-retaining material of generally concavo-convex shape and an inner sheet of flexible shock absorbing material which extends beyond said outer sheet of rigid, form-retaining material to define a peripheral margin, means for securing said sheets together to form a unitary structure, and a flexible member secured to an upper edge of the protector, said member having eyes formed therein adapted to receive a lace from the shoulder harness whereby the protector can be laced to the shoulder harness.

4,317,238
ADJUSTABLE CAP KIT
Armando Amin, 1320 NW. 3 St., Apt. 4, Miami, Fla. 33125
Filed Apr. 11, 1980, Ser. No. 139,409
Int. Cl.³ A42B *1/20, 1/22*
U.S. Cl. 2—12 **9 Claims**



1. An adjustable cap kit comprising:
a first band member of predetermined length defining a front band portion having a first end zone defining a first male connection means, a second end zone defining a second male connection means, upper and lower lateral edges spanning the first and second male connection means and spaced slit means along the first band member adjacent the lower edge,
a second band member of a predetermined length defining a rear band portion having first and second ends, upper and lower edges spanning the ends, and slit means adjacent the upper and lower edges defining female connection means, sized and shaped for compatible locking engagement with the first and second male connection means,
a reinforcing member having a predetermined length approximately equal to but slightly less than the length of the first member, the reinforcing member having equispaced openings therealong, the reinforcing member including first and second ends and upper and lower edges spanning the ends, and
a brim member having a visor portion and an inside abutment edge with a plurality of male connection members spaced apart along the inside edge, the male connection members sized and shaped for locking connection with the first member slit means and the reinforcing member,
each of said male connection members being spaced from one another and sized and configured for registry with and hooked-up engagement in the slit means of the first member and the openings of the reinforcing member,
whereby the front and rear portions are adapted for locking engagement with one another through their respective male connection means and the female connection means, and the brim member is adapted for connection with the first band member and reinforcing member respectively.

4,317,239
PROTECTIVE HELMET FOR THE RETARDED
Nicholas Bryksa, 293 Washington St., Phillipsburg, N.J. 08865
Filed May 5, 1980, Ser. No. 146,230
Int. Cl.³ A63B *71/10*
U.S. Cl. 2—411 **8 Claims**



1. A helmet to protect the head, including the face and chin, of persons with severe motor or mental disabilities comprising:
(a) a padded frontal forehead piece of a height and width adapted to span the forehead of a wearer and terminating on each end in
(b) two padded side pieces, said side pieces each being an identical, mirror image of the other, curved in construction to adapt to the contour of the wearer's head, extending on the wearer longitudinally from approximately cheekbone to approximately the center of the back of the wearer's head and vertically from the wearer's crown to chin bone and including an aperature placed so that the side piece surrounds but leaves open the ear;
(c) a crown cover comprising a T-shaped strap connecting said frontal piece and each of said side pieces;
(d) a padded frontal chin piece parallel to said forehead piece adapted to span the chin front of the wearer and terminating in said side pieces;
(e) a generally arcuate, padded chin underpiece attached to and in alignment with said frontal chin piece and said side pieces so that said chin underpiece covers the entire under chin area of the wearer;
(f) an under chin rim piece comprising a continuous, curved extension of said chin underpiece to cup said wearer's jowls to prevent the wearer from removing said helmet by pulling it from his head; and
(g) means to removably secure said side pieces to each other at the back of the wearer's head whereby said wearer of

said helmet is protected from injury on the sides, forehead, chin front and under chin area from contact injury.

4,317,240

SPORTS GOGGLE

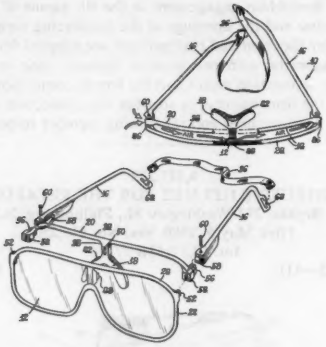
Gottfried Angerman, Neuhofen; Otto Armbrust, Traun; Franz Dianitsch, Linz, and Berthold Hiebl, Traun, all of Austria, assignors to Carrera International Corporation, Norwood, N.J.

Filed Sep. 8, 1980, Ser. No. 184,794

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1979, 2950090; Dec. 20, 1979, 7935863[U]; Finland, Jun. 10, 1980, 801858

Int. Cl.³ A61F 9/02

U.S. Cl. 2—436 **13 Claims**



1. A goggle comprising:

a single lens means;

an anterior frame section having a bow and extending across at least the upper portion of said lens means and supporting the single lens means;

a posterior frame section for supporting said anterior frame section and having a bow extending generally parallel to said bow of said anterior frame and for positioning adjacent the brow of the wearer and defining a slot with said bow on said anterior frame section for the flow of air to said lens means;

a nose piece on said posterior frame section for resting on the wearer's nose;

spacer means connecting said anterior and posterior frame sections and spacing the same with the slot between said bows; and

means connected with the end of said posterior frame section for connection to wearer's head for maintaining the position of the goggle on the wearer's face.

4,317,241

BREAST PROSTHESIS

Bodo Knoche, Stöckumer Str. 24, D-3204 Nordstemmen 4, Fed. Rep. of Germany

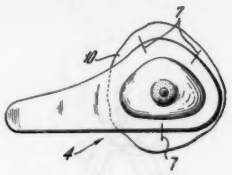
Filed May 1, 1980, Ser. No. 145,706

The portion of the term of this patent subsequent to Apr. 29, 1997, has been disclaimed.

Int. Cl.³ A61F 1/00

U.S. Cl. 3—36 **3 Claims**

1. A breast prosthesis die cast formed of a skin-colored soft silicone rubber cross-linked with an amount of hardeners such that it vulcanizes to a soft elastic material forming an outer surface facing outwardly away from a wearer and an inner surface facing inwardly toward the wearer, and comprising an integral base including a central part, an edge extension and a flap-like section, said central part having a convex outer surface and a concave inner surface forming a hollow cup-shaped form, said convex outer surface having the shape of a female breast including a nipple and an areola, said concave inner surface having a breast-like shape being spaced from the outer surface and forming therebetween the wall thickness of the central part, said central part having a passage extending through said nipple from the outer surface to the inner surface, said edge extensions being thin and flexible and laterally enclosing said central part, said edge extension having a width outwardly from said central part so that said edge extension does not extend outwardly from the edge of a brassiere with which it is worn, said flap-like section connected to said edge



extension and extending laterally outwardly from said central part toward the closest side of the wearer with said flap-like section having a length and width sufficient for covering the auxillary lymph-gland area when the prosthesis is in place, wherein the improvement comprises a filler part formed integrally with said inner surface of said prosthesis and being attached to said edge extension, said filler part projecting from said edge extension away from the hollow cup-shaped form of said central part so that said filler part fits into a cavity formed inwardly of the normal line of the chest case of the wearer whereby the prosthesis assumes its normal position.

4,317,242

DEVICE FOR THE REMOVAL OF FOUL AIR FROM TOILET BOWLS AND THE LIKE

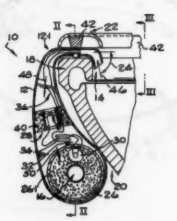
Robin H. Stamper, 1891 Westborne Rd., Bryanston, Transvaal Province, South Africa

Filed Sep. 28, 1979, Ser. No. 80,014

Claims priority, application South Africa, Sep. 29, 1978, 78/5539

Int. Cl.³ E03D 9/04

U.S. Cl. 4—213 **6 Claims**



1. For use in a toilet bowl having a rim and a seat supportable on the rim with a space between the seat and the rim, the improvement of having a device for removing foul air from the toilet bowl, said device comprising

a conduit having an inlet opening and at least one outlet opening spaced from the inlet opening, said conduit having a hook shape adapted to hook over and be suspended from the toilet bowl rim under the seat such that the inlet opening is disposed within the bowl, and the outlet opening is disposed outside the bowl;

a pressure sensitive switch member projecting downwardly through the underside of the conduit between the inlet and the outlet, said switch member being the fulcrum by which the device hangs from the toilet bowl rim, said

switch member being in the open position when pressure is not applied to the seat;

air treatment means within the conduit and adapted to improve the quality of foul air passing therethrough;

a battery-operable fan adapted to draw foul air out of the bowl via the inlet opening, and to pass it along the conduit through the air treatment means and out of the outlet opening;

electrical leads connecting the switch member, the fan and the battery to provide an electrical path between the switch member, fan and battery when pressure is applied to the seat causing the conduit to be lowered towards the rim of the toilet bowl and thereby causing the switch member to be in the closed position; and

securing means extending from the conduit and passing around the toilet bowl for securing the conduit to the toilet bowl in a manner to prevent unauthorised removal.

4,317,243

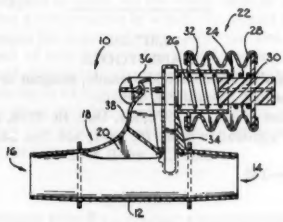
SYSTEM FOR CLEANING THE INTERIOR SURFACE AREA OF A VESSEL

Fernand L. O. J. Chauvier, 7 Caribou Rd., Selcourt, Springs, Transvaal Province, South Africa

Continuation of Ser. No. 965,862, Dec. 4, 1978, abandoned. This application May 27, 1980, Ser. No. 153,447

Int. Cl.³ E04H *3/20*

U.S. Cl. 4—490 **7 Claims**



1. A system for cleaning an interior surface area of a vessel, as well as for simultaneously skimming the surface of liquid carried in that vessel, said system comprising

a cleaning device adapted to clean said interior surface area of said vessel through use of liquid drawn therethrough,

a valve connected with said cleaning device, said liquid being directed through said valve after being drawn through said cleaning device, said valve comprising a closure for an auxiliary opening that is locatable adjacent the surface of said liquid, said closure being movable between a closed position at which said auxiliary opening is closed, an intermediate open position at which said auxiliary opening is partially opened, and a full open position at which said auxiliary opening is substantially completely opened, and

a variable bias device connected with said closure for inducing said closure to move toward its full open position in response to reduced fluid flow through said auxiliary opening which results from exterior blockage detritus on the surface of said liquid against said auxiliary opening, said bias device being operable to bias said closure to it closed position when there is no liquid flow through said valve, said bias device being operable to decrease the closing bias force exerted on said closure below that established when there is no fluid flow through said valve for the purpose of opening said closure to its intermediate open position when there is fluid flow without substantial exterior blockage through said valve, and said bias device being operable to decrease the closing bias force exerted on said closure below that required for opening said closure to its intermediate open position as the fluid flow through said auxiliary opening decreases in response to at leat a partial exterior blockage of said auxiliary opening, said closure thereby being moved toward said full open position in response to said exterior blockage for inducing increased fluid flow through said auxiliary opening to clear said exterior blockage from said auxiliary opening.

4,317,244

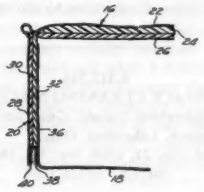
MATTRESS COVER FOR AN INFLATABLE AIR MATTRESS

Gordon A. Balfour-Richie, 50 St. Francis Way, Santa Barbara, Calif. 93105

Filed Apr. 21, 1980, Ser. No. 141,779

Int. Cl.³ A47G *9/00*; **A47C** *27/08*

U.S. Cl. 5—449 **1 Claim**



1. In combination with an inflatable air mattress, a cover for said inflatable air mattress comprising:

an enclosed housing having an internal compartment, said air mattress being located within said internal compartment, said housing being constructed of a top layer and a bottom layer connected by a side wall assembly;

said top layer being constructed of a plurality of layers of material comprising at least an outer layer and an inner layer comprising a soft fabric of quilted material, said inner layer to be located against said mattress, said inner layer to be constructed of a soft fabric having a smooth interior surface to eliminate the creating of noise between said mattress and said top surface during usage, said middle layer comprising a cushiony material;

said housing having an access opening to permit entry and removal of said inflatable air mattress with respect to said internal compartment, said access opening being closable by a releasable fastening means;

said bottom layer being constructed of a frictionally grabbing material to eliminate slippage of said cover and said contained mattress upon the surface upon which it has been placed; and

said side wall assembly being constructed of a first layer of material and a second layer of material and a third layer of material, said first layer of material being in contact with said mattress, said first layer of material being soft and cushiony, said second layer of material being relatively stiff and comprises about a quarter inch thick fibrous material to which is attached on one side thereof a plastic netting, said third layer of material being the most exterior and comprising a decorative fabric, said first layer and said second layer and said third layer of material being secured together.

4,317,245

WATER BED SHEET

Nu'man W. El-Amin, 4858 Logan Ave., Apt. 1, San Diego, Calif. 92113

Filed Jan. 21, 1980, Ser. No. 106,769

Int. Cl.³ A47G *9/00*

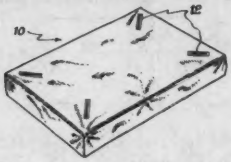
U.S. Cl. 5—497 **3 Claims**

1. A contour bedsheet comprising:

(a) a generally rectangular sheet having a planar top portion and four corners contoured to wrap around the corners of a mattress;

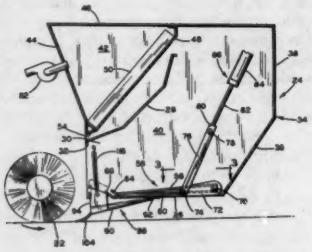
(b) four slitlike openings provided in said planar top portion

adjacent each respective corner of said sheet to permit one to reach through said openings to engage and raise the



respective corner of a mattress to slip said bedsheet thereover.

4,317,246
SURFACE CLEANING MACHINE
Christopher M. Knowlton, Toledo, Ohio, assignor to The Scott & Fetzer Company, Lakewood, Ohio
Filed Aug. 21, 1980, Ser. No. 180,090
Int. Cl.³ E01H *1/04*
U.S. Cl. 15—83 **20 Claims**



1. A machine for sweeping surfaces comprising a frame, wheel means supporting the frame on the surface, a rotatable sweeping brush carried by said frame, a hopper carried by said frame near said sweeping brush, said hopper comprising a bottom wall, two side walls, an upper wall, and an end wall defining a dirt and debris receiving chamber, said bottom wall, said top wall and said side walls defining an opening through which dirt and debris are received from said rotatable brush, a compactor flap pivotally mounted in said hopper at a location spaced from said opening, said flap having one position in which an outer edge spaced from the pivot is adjacent said opening and another position in which said outer edge is closer to said end wall, and means for moving said compactor flap between the positions.

4,317,247
DRIVE ATTACHMENT FOR A DRAIN CLEANING PLUMBING TOOL
Aaron J. Levine, 3147 N. Cambridge Ave., Chicago, Ill. 60657
Filed Mar. 3, 1980, Ser. No. 126,552
Int. Cl.³ B08B *9/02*
U.S. Cl. 15—104.3 SN **5 Claims**

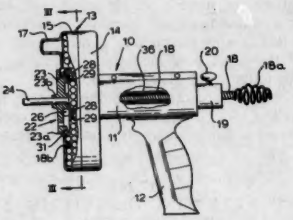
1. A drive attachment for use with a drain cleaning tool and an electric hand-held drill, said tool having a flexible plumber's rod coiled in a rotatable housing and a means for permitting manual feeding of said rod through said tool for insertion and rotation in a drain to be cleaned, said housing having a preformed circular opening in a rear face thereof, said drive attachment comprising:

a disc insertable in said circular opening,

said disc having an annular flange extending around the circumference thereof, said flange

overlapping the edge of said circular opening in said housing for providing a bearing surface for said disc against said housing;

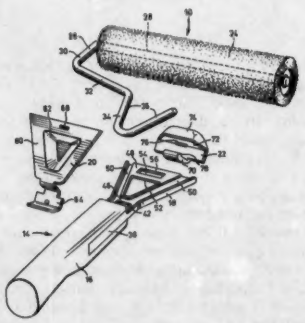
a plurality of bolts received in said disc at a periphery thereof for attaching said disc to said housing, said bolts respectively extending through a plurality of washers which overlap an interior edge of said circular opening for retaining said disc in said opening; and



an arbor receivable in a chuck of said drill, said arbor extending perpendicularly from a center of said disc and corotationally affixed thereto,

whereby rotational movement is transmitted from said drill to said housing through said drive attachment for rotation of said flexible rod.

4,317,248
HAND TOOLS
Morley L. Smith, Beaconsfield, Canada, assignor to T. S. Simms & Co. Limited, Saint John, Canada
Continuation of Ser. No. 970,383, Dec. 18, 1978, abandoned. This application Mar. 10, 1981, Ser. No. 242,291
Int. Cl.³ A46B *5/02*
U.S. Cl. 15—145 **2 Claims**



1. In combination, a paint or a decorating workpiece assembly and a handle assembly adapted for quick release coupling to one another to provide a manually supported tool having a rapidly interchangeable workpiece, said workpiece assembly comprising;

(a) a work head adapted to function as a painting or decorating tool,

(b) a support member mounted on said work head, said support member having a section of its length disposed rearwardly from said work head which extends in a tortuous path to form a first coupler element, said handle assembly comprising,

(i) an elongated manually engageable handle having an inner end and an outer end,

(ii) a quick release clamp assembly comprising first and second jaw members, said first jaw member having a first face which extends outwardly from the outer end of said

handle toward said work head in a first plane, a channel-shaped recess formed in said first face of said first jaw member and extending to a substantial depth below said first plane, said recess having a mounting passage opening longitudinally thereof in said first plane, said recess extending along said first jaw in a tortuous path, the configuration of which is such that the walls of the recess restrict relative movement between said first coupler element and said first jaw to movement into and out of said recess through said mounting passage in a first direction substantially perpendicular to said first plane, at least one end of said recess opening outwardly from said first jaw member at one edge of said first jaw member through which said support member extends to communicate between said first coupler element and said work head, said second jaw member having a second clamping face, said second jaw member being adapted to cooperate with said first jaw member for movement relative to said second jaw member between the clamping position in which said second clamping face overlies and closes said mounting passage of said channel-shaped recess to retain said first coupler element against movement in said first direction and a second position in which said clamping face is spaced from said second jaw to permit mounting and removal of said coupler element through said mounting passage,

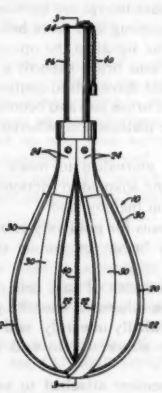
(iii) means for securing said jaws with respect to one another in said clamping position comprising a U-shaped body having first and second oppositely disposed legs spaced from one another by a clamping channel, said first leg being adapted to pivot on the outer edge of one of said jaws from a first position in which the second leg overlies and engages the outer end of the other jaw and secures the outer end of said jaws within said clamping channel to retain said jaws in said clamping position, said body being pivotable about its pivotal connection to move said second leg away from said first position to a position spaced from said other jaw to release said jaws for movement to said release position.

4,317,249

DEVICE FOR CLEANING CONTAINERS

Donald G. Benson, Pittsburgh, Pa., assignor to Benson Industries Inc., Bethel Park, Pa.

Filed Sep. 8, 1980, Ser. No. 185,148
Int. Cl.³ A46B 5/06
U.S. Cl. 15—213 **7 Claims**



1. A device for cleaning containers having an upper opening and neck section, and an enlarged generally spheroidally shaped main vessel, the device comprising:

a plurality of elongated resilient strip elements the lower sections of which being longitudinally curved and the upper sections being generally straight, said strip elements being constructed and arranged with respect to each other such that their respective upper sections form a generally tubular pattern and the lower sections form a generally bubble-shaped pattern;

scouring means on at least the outer surfaces of the lower portions of said strip elements;

force exerting means operable between the upper and lower sections of said strip elements for transmitting an upwardly directed force on the lower sections to expand the top portions of lower sections in a radially outwardly and upwardly direction;

locking means for locking said force exerting means in differing positions relative to the upper section of said strip elements; and

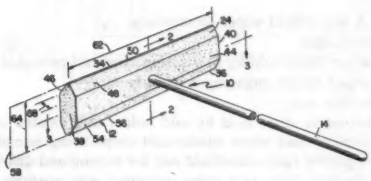
whereby said strip elements, force exerting means, and locking means are constructed and arranged with respect to each other such that the lower section of said strip elements will compress radially inwardly to allow entry thereof into the vessel and when a downwardly directed force is applied to said strip elements the lower sections expand radially outwardly to engage the neck section of a container, bottom surface, and at least the lower sections of the main vessel, and when an upwardly directed force is transmitted through said force exerting means to the lower sections of said strip elements the top portions of the lower sections expand radially outwardly and upwardly to engage the upper portions of the vessel, with said force exerting means securable to said locking means for holding said strip elements in any desired pattern within the vessel so that said strip elements may be rotated to clean the inside of the container.

4,317,250

SNOW REMOVING DEVICE

Carl V. Shutts, P.O. Box 455, Valparaiso, Ind. 46383

Filed Oct. 5, 1979, Ser. No. 82,332
Int. Cl.³ A47L 25/00; B60S 3/04
U.S. Cl. 15—244 R **12 Claims**



1. A snow removing device comprising:

an elongated head having a front side and a rear side;

said head having a length and a height, the height extending transverse to the length, said head having a large snow removing portion extending in the direction of its length and a small snow removing portion extending in the direction of its height;

said head including a rigid core and a resilient sheath surrounding and completely encapsulating said core, said core having a block-like configuration, said sheath having front and rear sides which define the front and rear sides, respectively, of said head, said head having an outer thickness dimension extending in perpendicular relationship to said length and height of said head and in the general direction which said handle extends, said core including an inner thickness dimension extending in the same direction as said outer thickness dimension of said head, said outer thickness dimension being between 1.5 and 2.5 times said inner thickness dimension, so that said inner thickness of said core constitutes a substantial portion of said outer thickness of said head;

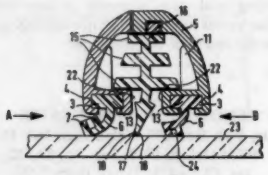
said sheath being constructed of an expanded, cellular polyethylene foam material, said core being of a material different from that of said sheath;

an elongated handle extending from said head;
said core including means for attaching said handle thereto, said handle being directly attached to said core by said attaching means, said handle being attached to said core only by said direct attachment to said core;
said handle extending from said core through one side of said sheath;
said attaching means including a threaded socket in said core and a threaded end on said handle, said threaded end cooperatively engaging said threaded socket, said threaded socket having a depth which constitutes at least a substantial portion of said inner thickness of said core,
whereby a strong, secure and rigid connection is effected between said core and said handle and a strong and substantial core is provided to lend strength to the snow removing device.

4,317,251
WINDSHIELD WIPER

Wolfgang Priesemuth, Postkamp 13, 221 Itzehoe-Nordoe, Fed. Rep. of Germany

Filed Jun. 14, 1980, Ser. No. 177,860
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1979, 2933363
Int. Cl.³ B60S 1/04
U.S. Cl. 15—250.41 **11 Claims**



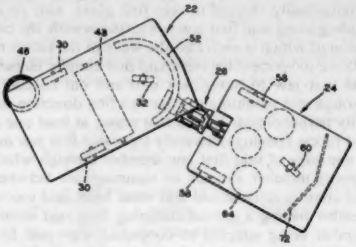
1. A windshield wiper, comprising:
spring clips;
a wiper blade held by said spring clips and provided with a wiper lip for engaging a windshield;
a holder; and
elastomeric strips held by said holder and located on both sides of said wiper blade, said strips being intended for engaging said windshield and for storing and distributing cleaning fluid, said strips including web portions which project toward, and are adapted to engage, said windshield, said web portions including a smooth inner side of trailing web portions and on an outer side of leading web portions being provided with outwardly projecting lateral ribs and having such a flexibility that, during movement of said windshield wiper on said windshield, the ribbed outer side of the leading web portions, and the smooth inner side of the trailing web portions, engage said windshield, said lateral ribs extending at such an angle that when engaging said windshield to be cleaned, they extend at an acute angle to the central longitudinal axis of said strip.

4,317,252
SWEEPER-SCRUBBER

Christopher W. Knowlton, Toledo, Ohio, assignor to The Scott & Fetzer Company, Lakewood, Ohio

Filed Jul. 14, 1980, Ser. No. 168,534
Int. Cl.³ A47L 11/29
U.S. Cl. 15—320 **20 Claims**

1. In combination, a sweeper having a rotatable sweeping brush, and connecting means at a rear portion thereof, a scrubbing unit having a rotatable scrubbing brush, a tank for supplying clean water to a surface to be cleaned, a recovery tank, means for returning water from the surface to the recovery tank, and a hitch extending forwardly of the scrubbing unit and connected to said connecting means to enable said scrubbing

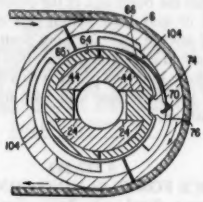


unit and said sweeper to move in horizontal angular relationship relative to one another.

4,317,253
ROTARY BRUSH DRIVE PROTECTOR

Stanley J. Gut, deceased, late of Wayne, N.J. by Lillian Gut, executrix, and Don W. Vermillion, Anderson, S.C., assignors to The Singer Company, Stamford, Conn.

Filed Feb. 19, 1980, Ser. No. 122,772
Int. Cl.³ A47L 9/04
U.S. Cl. 15—390 **1 Claim**



1. In a vacuum cleaner having a motor; a rotary brush; a flexible drive belt for transmitting rotary motion from said motor to said brush, said drive belt encircling said brush; an override clutch means interposed between said drive belt and said brush for decoupling said drive belt from said brush and providing an audible signal to the operator when the torque required to rotate said brush exceeds a predetermined level thereby allowing said drive belt to continue to operate without damage should said brush jam and become stalled and alerting the operator of the malfunction; wherein said override clutch means comprises:
a. a belt pulley journalled to rotate with respect to said rotary brush and adapted to frictionally engage said drive belt for rotation thereby; and
b. a coupling means for positively coupling said belt pulley to said rotary brush for mutual simultaneous rotation including;
1. an inner diameter of said belt pulley having a boss formed on an otherwise smooth cylindrical surface and projecting radially inwardly, said inner diameter being substantially concentric to said rotation of said belt pulley;
2. a spring member attached to said rotary brush and adapted to rotate therewith having a deformable end which is urged into engagement with said discontinuity in said inner diameter by a predetermined level of radially directed force;
3. said discontinuity being formed such that when said relative torque exceeds said predetermined level said deformable end disengages said discontinuity;

wherein said belt pulley comprises a plurality of mutually interlocking segments.

4,317,254

DOOR CLOSER

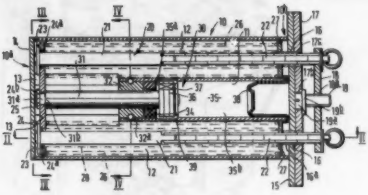
Dennis H. Chaddock, Loughborough, England, assignor to Perkins & Powell Limited, Birmingham, England

Filed Mar. 20, 1980, Ser. No. 132,319

Claims priority, application United Kingdom, Mar. 20, 1979, 79097/79

Int. Cl.³ E05F *3/04, 3/12*

U.S. Cl. 16—61 **15 Claims**



1. A door closer comprising:

(a) a housing for fitting into a door and an anchor plate for fixing to a door frame adjacent to said door;

(b) a tension member extending longitudinally within the housing and having an outer end portion thereof in the form of an articulated chain which is coupled to said anchor plate;

(c) main spring means in said housing and acting on said tension member to urge the latter inwardly of the housing and draw the housing and the anchor plate together so as to close the door to which the closer is fitted;

(d) damping means comprising a piston coupled to said tension member and slidable in a fluid-filled chamber which is divided into two compartments with valve means permitting relatively free movement of the fluid from one compartment to the other when the piston is moved in response to movement of the tension member outwardly of the housing, that is in the door opening direction, but affording sufficient resistance to movement of the fluid in the opposite direction to control the rate of movement of the tension member inwardly of the housing, that is in the door closing direction, under the force of said spring means;

(e) a lost motion means whereby the piston is coupled to said tension member for enabling the tension member to be moved inwardly of the housing in the door closing direction in response to an external force at a rate faster than that determined by said main spring means under the control of the damping means; and

(f) additional spring means for maintaining tension in said articulated chain independently of said main spring means.

4,317,255

REPLACEMENT WHEEL ASSEMBLY FOR FREIGHT CAR DOOR AND METHOD OF INSTALLING

Douglas M. Camp, Midlothian, Ill., assignor to Teams, Inc., Chicago Heights, Ill.

Filed Jan. 10, 1980, Ser. No. 111,095

Int. Cl.³ E05D *13/02*

U.S. Cl. 16—102 **20 Claims**

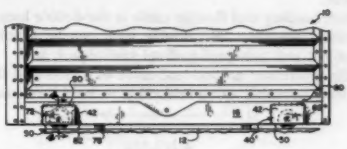
1. A wheel assembly for replacing a wheel of the sliding door of a railroad freight car which wheel normally engages a rail on the side of the freight car spaced below the bottom of the door when the door slides, said assembly comprising:

A. a generally rectangular metal plate,

B. a U-shaped bracket having side arms and a crossbar, the U-shaped bracket being secured to the rear surface of the plate by the ends of its side arms, the side arms being spaced inwardly of the side edges of the plate and the crossbar being spaced from the rear surface of the plate,

C. a wheel mounted on a stub shaft and journalled between the plate and crossbar,

D. the bracket being secured to the plate spaced above the bottom edge of said plate,



the rear surface of the plate adapted to be welded over a hole in said freight car door adjacent the bottom edge of said door with the wheel and said bracket on the interior of the door, the wheel being capable of extending through the bottom of the door and into engagement with said rail when the plate is so welded.

4,317,256

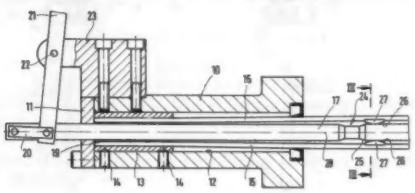
EXPANDABLE MANDREL DEVICE FOR LONGITUDINAL SHIRRING OF FLEXIBLE TUBULAR MATERIAL

Henricus H. H. Senders, Eindhoven, Netherlands, assignor to Gunter Kollross, Dornheim, Fed. Rep. of Germany

Filed Jan. 16, 1980, Ser. No. 112,474

Int. Cl.³ A22C *13/02*

U.S. Cl. 17—1 R **15 Claims**



1. A device for the longitudinal shirring of a flexible tube material such as synthetic gut used in making sausage casings, comprising:

a tubular mandrel formed by at least three generally parallel rod-like elongated spring elements, secured at one end and distributed in a cylindrical path around the axis of the mandrel,

and expanding means within the tubular mandrel for expanding the elongated elements radially outwardly by urging the said elongated elements radially outwardly at the location along the axis of the tubular member at which the shirring takes place.

4,317,257

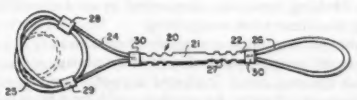
ANIMAL CARRYING AND SKINNING DEVICE

A. Richard Engel, 7250 Blue Hill Dr., San Jose, Calif. 95129

Filed Feb. 19, 1980, Ser. No. 122,432

Int. Cl.³ A22B *5/16*

U.S. Cl. 17—21 **2 Claims**



1. A pulling device comprising:

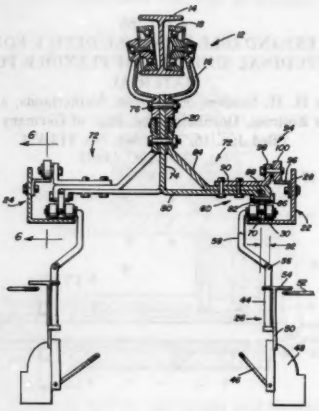
an elongated flexible cable;
a sleeve having an opening therethrough with the flexible cable ends held in said opening to form a loop extending from one end of the sleeve;
means holding the flexible cable in said sleeve;
said flexible cable being doubled over to form a double loop; and
means holding said flexible cable in the double loop configuration whereby said double loop can be fitted over an object and tightened to hold said object; and
a clip positioned around said cable as it exits said sleeve and being movable along said cable to hold it on said object.

4,317,258

SIDE SUSPENSION CONVEYOR SYSTEM FOR POULTRY

William F. Altenpohl, and Paul J. Altenpohl, both of High Point, N.C., assignors to W. F. Altenpohl, Inc., High Point, N.C.

Filed Jun. 12, 1980, Ser. No. 158,922
Int. Cl.³ A22B 5/00; A22C 21/00
U.S. Cl. 17—24 **20 Claims**



1. In combination with a conveyor, a load supporting track spaced therebelow and a vertically elongated load carrier, a bearing shaft having opposite axial ends, a pulling link pivotally connecting the conveyor to said bearing shaft intermediate the axial ends thereof, roller means mounted on said bearing shaft for rolling contact with said track, and suspension means connected to one of said axial ends of the bearing shaft for pivotally suspending the load carrier from the bearing shaft in laterally spaced relation to the conveyor relative to conveyor travel direction.

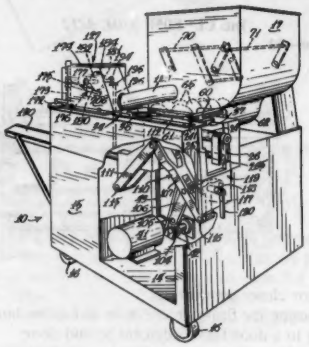
4,317,259

MOLDING APPARATUS

Richard C. Wagner, Frankfort, Ill., assignor to Hollymatic Corporation, Park Forest, Ill.

Continuation-in-part of Ser. No. 86,761, Oct. 22, 1979. This application Jun. 19, 1980, Ser. No. 161,021
Int. Cl.³ A22C 7/00
U.S. Cl. 17—32 **7 Claims**

1. Molding apparatus surrounded by air for molding patties of ground raw meat, comprising:
a hopper for holding a supply of said meat;
a mold having a patty shaped mold cavity;
exit opening means from said hopper;
a pressure chamber for receiving said meat from said hopper through said exit opening;
transfer means in said hopper for moving said ground raw meat toward said exit opening from the hopper and into said pressure chamber;
means defining a fill opening extending between said pressure chamber and a said mold cavity for filling said cavity with pressurized meat;
a pressure ram in said pressure chamber, said chamber having a meat pressurizing chamber section from which said meat is forced by said ram through said fill opening and into a said mold cavity;



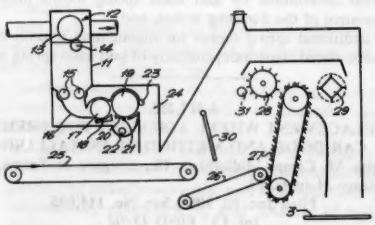
means for moving said mold between a filling position for said cavity and an ejecting position for removal of said patty from said cavity;
means for reciprocating said ram in its said pressure chamber toward and away from said fill and exit openings thereby tending to create a vacuum in said chamber section on said away movement; and
means for venting said chamber to the surrounding air to relieve said vacuum with air from said surrounding air.

4,317,260

METHOD IMPROVEMENT TO INCREASE THE PROPORTION OF USABLE FIBERS IN PROCESSABLE TEXTILE FIBER STOCK

Reginald M. Blackburn, deceased, late of Accrington, England by Althea Blackburn, administratrix, assignor to Platt Saco Lowell Limited, United Kingdom

Filed Dec. 21, 1978, Ser. No. 972,140
Claims priority, application United Kingdom, Dec. 24, 1977, 53895/77
Int. Cl.³ D01G 9/12, 9/16
U.S. Cl. 19—107 **5 Claims**



1. In a method for separating trash from usable fibers for subsequent use of the fibers to make yarn, which method employs a system for cooperating machines to effect its steps, at least some of which machines contain means for separating a waste material from the bulk of fibers being processed and wherein said waste material contains both trash and otherwise usable fibers, the improvement comprising the steps for
separating or extracting said waste materials from said bulk

of fibers at a plurality of said machines having said means therefor, wherein said separating step is performed in a manner for providing in each of said separated waste materials an abnormally high proportion of otherwise usable fibers and for providing in the bulk of fibers remaining after said separating an abnormally low proportion of trash,

bringing together said plurality of separated waste materials containing said abnormally high proportion of fibers,

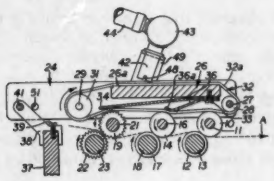
reseparating said separated waste materials into a bulk of trash containing some otherwise usable fibers and a further bulk of fibers containing some trash, and for

bringing together said further bulk of reseparated fibers with said bulk of fibers for further processing of said fibers to form yarn.

4,317,261
CLEARER FOR DRAWING ROLLS OF SPINNING MACHINES AND THE LIKE

Fletcher D. Adamson, Alexander City, Ala., assignor to Russell Corporation, Alexander City, Ala.

Filed Jun. 9, 1980, Ser. No. 157,326
Int. Cl.³ D01H *5/60*
U.S. Cl. 19—265 **3 Claims**



1. In a clearer for the top rolls of a roll assembly of a textile spinning apparatus, said spinning apparatus having a frame member located adjacent the rear of the roll assembly, and an upper, powered, serrated drawing roll located adjacent the rear of the assembly,

(a) a clearer frame having horizontally disposed vertical side members and a horizontally disposed belt supporting plate secured between said side members,

(b) means pivotally supporting the clearer frame from said apparatus frame member,

(c) front and rear horizontally disposed belt idler rolls mounted between the vertically disposed clearer frame members, the top surfaces of said rolls lying below the level of the belt supporting surface of said belt supporting plate,

(d) an endless belt passing over said rolls,

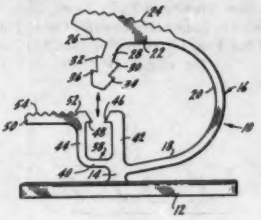
(e) spring friction means located between the flights of the belt and having one element disposed to press the outer surface of the lower flight of the belt into frictional driving contact with the upper serrated roll and another element disposed to press the outer surface of said belt into clearing engagement with a drawing roll located forwardly of said serrated roll, and

(f) the relative dimensions of the parts of the clearer being such that when in position on the spinning apparatus the outer surface of said belt also contacts in clearing engagement at least one other roll located forwardly of the serrated roll.

4,317,262
RELEASABLE CABLE CLAMP

Peter M. Wells, Jr., Sycamore, Ill., assignor to Ideal Industries, Inc., Sycamore, Ill.

Filed Sep. 12, 1979, Ser. No. 75,191
Int. Cl.³ B65D *67/02*; F16L *3/08*
U.S. Cl. 24—16 PB **11 Claims**



1. In a releasable cable clamp of the type having a base, a closure device connected to the base, a strap connected to the base and extending in a generally arcuate manner to form a cable-securing loop, the strap having a catch suitable for engagement with the closure device to close and lock the clamp, the improvement comprising means for releasing the catch from the closure device including:

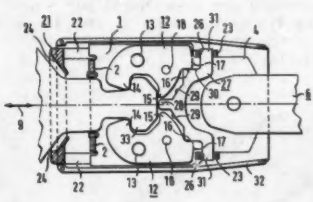
interlock means formed on the strap; and

a releasing latch connected to the base and having interlock means which mate with the interlock means of the strap when the clamp is closed so that actuation of the releasing latch moves the strap to a point where the catch disengages from the closure device, allowing the clamp to open.

4,317,263
BELT LOCK FOR A SAFETY BELT

Artur Föhl, Schorndorf, Fed. Rep. of Germany, assignor to Repa Feinstanzwerk GmbH, Alfdorf, Fed. Rep. of Germany

Filed Aug. 2, 1979, Ser. No. 63,255
Claims priority, application Fed. Rep. of Germany, Aug. 22, 1978, 2836748
Int. Cl.³ A44B *11/26*, *19/00*
U.S. Cl. 24—230 AT **14 Claims**



1. Belt lock for a safety belt with a plug-in opening for the insertion of a plug-in tongue fastened to the belt, a spring-operated locking catch with a hooked part in the belt lock engaging the plug-in tongue when inserted in the plug-in opening of the belt lock, a hand-operated member movable against the force of a spring for operating the locking catch to detach the tongue from the belt lock, a locking part in fixed connection with the hand-operated member, wherein in the locked position of the belt lock, the locking part is disposed in the path of motion of the hooked part preventing the latter from disengaging the tongue, and wherein the locking part presses the plug-in tongue by spring action against the hooked part of the locking catch and wherein when the hand-operated member is moved against the force of said spring, the locking part in fixed

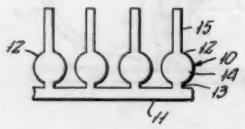
connection with the hand-operated member is also moved out of the path of motion of the hooked part permitting the hooked part to become disengaged from the tongue, and the tongue to detach from the belt lock.

4,317,264

MEANS AND METHOD FOR MAKING JEWELRY

Max Bogner, New York, and Larry Grun, Rego Park, both of N.Y., assignors to Four Stars Jewelry Corp., New York, N.Y.

Filed Feb. 11, 1980, Ser. No. 120,734
Int. Cl.³ B23P *13/00*
U.S. Cl. 29—8 **5 Claims**



4. The method of making an article of jewelry comprising the steps of:

(a) providing a plurality of basic link element blanks of generally planar configuration, each including an elongated bar defining one edge thereof, and having a plurality of discrete decorative members extending in substantially parallel relation unilaterally from said edge, said decorative members having a bendable terminal portion on a free end thereof;

(b) interconnecting said link element blanks together by engaging said terminal portions of one link element with portions of the elongated bar of an adjacent link element in staggered relation to form a strip having a principal axis and capable of limited flexibility along axes perpendicular to said principal axis;

(c) providing a rigid base of desired configuration having an outer peripheral surface; and

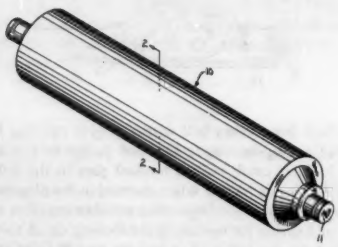
(d) securing said strip to said outer surface.

4,317,265

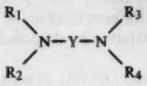
ELECTRICALLY CONDUCTIVE ELASTOMERS

Thomas G. Chase, Union Grove, and Steven Poniatowski, Madison, both of Wis., assignors to American Roller Company, Chicago, Ill.

Continuation-in-part of Ser. No. 943,019, Sep. 18, 1978, abandoned. This application Jan. 31, 1980, Ser. No. 117,274
Int. Cl.³ B21B *31/08*; H01B *1/00*
U.S. Cl. 29—132 **9 Claims**

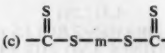


1. The method of preparing an electroconductive elastomer having resistivity of about 1×10^3 to about 1×10^7 ohm cm which comprises reacting a halogenated polymer selected from the group consisting of polychloroprene, bromobutyl, chlorobutyl, chlorosulfonated polyethylene, chlorinated polyethylene-chloroprene, epichlorohydrin-chloroprene and blends thereof with about 1 to about 15 parts per 100 parts of the polymer of a polyfunctional amine selected from compounds of the formula:

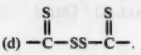


wherein R_1, R_2, R_3 and R_4 are aliphatic groups of 1 to 8 carbon atoms and Y is selected from (a) an alkylene of the formula:

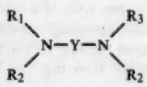
in which z is 1 to 5, R_5 and R_6 are selected from hydrogen, lower alkyl of 1 to 5 carbons, hydroxy and amino groups, (b) C═S,



in which m equals a polyvalent metal cation, and

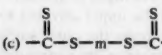


6. An electroconductive elastomer having a resistivity of about 1×10^3 to about 1×10^7 ohm cm which is prepared by reacting a halogenated polymer selected from the group consisting of polychloroprene, chlorobutyl, bromobutyl, chlorosulfonated polyethylene, chlorinated polyethylenechloroprene, epichlorohydrin-chloroprene and blends thereof with about 1 to about 15 parts per 100 parts of the polymer of a polyfunctional amine selected from compounds of the formula:

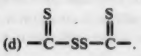


wherein R_1, R_2, R_3 and R_4 are aliphatic groups of 1 to 8 carbon atoms and Y is selected from (a) an alkylene of the formula:

in which z is 1 to 5, R_5 and R_6 are selected from hydrogen, lower alkyl of 1 to 5 carbons, hydroxy and amino groups, (b) C═S,



in which m equals a polyvalent metal cation, and



4,317,266

THRUST BEARING ASSEMBLY METHOD

John T. Armstrong, Avenel, N.J., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 10, 1980, Ser. No. 168,465
Int. Cl.³ B21D *53/10*
U.S. Cl. 29—148.4 A 2 Claims

1. A method for assembling a thrust bearing roller cage with an outer circular rim and a thrust race having an outer axial flange including a plurality of preformed symmetrically disposed radially inward rigid projections which retain the cage within the thrust race, comprising,

placing one portion of the outer circular rim of the roller cage to one side of all but one of the projections and the diametrically opposed other portion of the rim to the other side of the one projection of the thrust race,

elastically bending the thrust race and the one projection about a fulcrum orthogonal to the one projection to move the one projection from the original position to a displaced position axially and radially outwardly of the other portion of the rim,

moving the other portion of the rim to a position to the one side of the original position of the one projection,

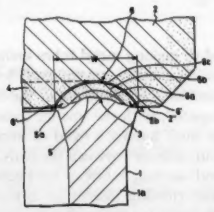
and releasing the thrust race to self-straighten and return the one projection to the original position to retain the other portion of the rim to the one side thereof.

4,317,267

METHOD FOR MAKING VALVE MOVING PUSH ROD FOR INTERNAL COMBUSTION ENGINES

Masayoshi Usui, Numazu, Japan, assignor to Usui Kokusai Sangyo, K.K., Japan

Division of Ser. No. 944,018, Sep. 20, 1978, Pat. No. 4,218,996. This application Apr. 1, 1980, Ser. No. 136,357
Int. Cl.³ B23P *15/00*; B23K *11/02*
U.S. Cl. 29—156.7 B 1 Claim



1. A method of manufacturing an improved valve moving push rod for an internal combustion engine wherein each push rod consists of a steel tube material welded by electric resistance to an end piece, said steel tube material having at one end an annular port, while the end piece has an end surface made of one of a concave or convex arcuate surface and a fixed side surface made of a flat surface, said end piece having a peripheral wall surface formed with a carbon-hardened layer, said annular port being welded to said fixed side surface of said end piece so that a cotransition boundary range including a fusing boundary surface is formed annularly about the periphery of said port at the end of said steel tube material and extends in a segmental section into said carbon-hardened layer, said method comprising the steps of:

providing a steel tube and an end piece having a carbon hardened layer on the peripheral wall surface of said fixed side surface;

bringing the carbon hardened layer of the fixed side surface of said end piece into contact with the periphery of the annular port of said steel tube material;

welding said contacted members by instantaneously passing a welding current therethrough in such manner as to confine the expansion of the cotransition boundary range for both inside and outside of the tube so as to be limited within the fusing boundary layer; and

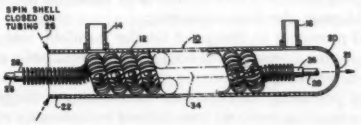
high frequency electrically heating the contacted members simultaneously with cutting off of the welding current, thereby reducing the quick temperature drop which would otherwise be effected in the fused parts so as to inhibit the generation of cracks therein.

4,317,268

PROCESS FOR MAKING A HEATER EXCHANGER

Donald R. Bowden, and Bruce J. Noveil, both of Huntsville, Ala., assignors to Solar Limited, Inc., Huntsville, Ala.

Division of Ser. No. 64,668, Aug. 8, 1979, which is a continuation-in-part of Ser. No. 836,812, Sep. 26, 1977, abandoned. This application Nov. 17, 1980, Ser. No. 207,563
Int. Cl.³ B23P *15/26*
U.S. Cl. 29—157.3 AH 2 Claims



1. The process of making a heat exchanger having an outer shell member for carrying a first liquid and having a double-walled volute member having an outer finned tube and an inner tube passing through the outer tube and carrying a second liquid for heat exchange with said first liquid, including the steps of:

(a) inserting a length of said inner tube into a length of said outer tube to form a double-walled member with enough space between the tubes to pass liquid between them;

(b) winding the double-walled member into a tight helical volute in which the fins of adjacent convolutions substantially touch each other and in which the aperture through the center of the volute has a diameter no greater than twice the diameter of the outer tube minus its fins, and providing unwound end portions of the double-walled member which extend from the volute;

(c) inserting a core member into the space through the center aperture of the volute in contact with the fins to substantially close the space;

(d) inserting said volute into a tubular shell comprising said outer shell member and having an internal diameter which closely fits against the edges of the fins at the outer periphery of the volute, and extending said end portions of the double-walled member from the shell;

(e) providing inlet and outlet ducts through the shell for conducting said second liquid; and

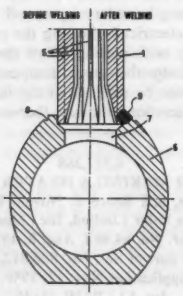
(f) closing the ends of the shell and sealing the outer tubing to the shell where it passes therethrough.

4,317,269

APPARATUS FOR REVAPORIZING LIQUEFIED GASES

Jean-Francois Martin, La Celle St. Cloud, and Michel Drouineau, Mouzillon-Lamotte, both of France, assignors to Societe Anonyme dite: Ateliers et Chantiers de Bretagne-ACB, Nantes, France

PCT No. PCT/FR80/00022, § 371 Date Oct. 12, 1980, § 102(e) Date Sep. 22, 1980
PCT Filed Feb. 12, 1980, Ser. No. 212,056
Claims priority, application France, Feb. 12, 1979, 79 03432
Int. Cl.[3] B23P *15/26*
U.S. Cl. 29—157.3 R 1 Claim



1. In a method of manufacturing an apparatus for vaporizing liquid gases, the steps comprising:

(a) providing an elongated tubular manifold, said manifold having a longitudinal bore and a longitudinally extending exterior flat portion;

(b) providing an elongated tube having a longitudinally extending bore said bore defined by a plurality of circumferentially spaced, radially inwardly extending fins, the exterior of said tube having two diametrically opposed fins extending radially outwardly from and longitudinally of said tube exterior;

(c) said flat portion of said manifold having a width at least equal to the diameter of the exterior of said tube;

(d) removing said diametrically opposed fins along a length of about 120 mm from one end of said tube;

(e) conically boring the inside of the tube at said one end so as to reduce the height of the inner fins progressively from the axial end inwardly to zero but without reducing the thickness of the tube between said fins;

(f) drilling a radial bore in the manifold centered on said flat surface portion to a diameter equal to the inside diameter of the tube at said one end;

(g) counterbore drilling the bore of the manifold concentrically with the bore described in (f) starting from the flat surface portion down to a depth of about 5 mm to a diameter equal to the outside of said tube at said one end;

(h) forming a groove on the manifold which groove is concentric with said radial bore, the space between said bore and said groove being equal to twice the thickness of the wall of the tube outside the inner fins;

(i) fitting said one end of said tube in the counterbore described in (g); and

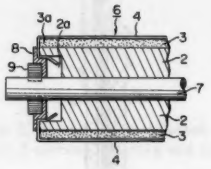
(j) welding the exterior of said tube at said one end to the flat surface portion of said manifold.

4,317,270

METHOD OF MAKING AN ELASTIC ROLLER

Tsuyoshi Watanabe, Kawasaki; Hidetoshi Murase; Akira Murayama, both of Yokohama, and Mikio Nakasugi, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 55,559, Jul. 9, 1979, Pat. No. 4,268,943.
This application Feb. 3, 1981, Ser. No. 231,111
Claims priority, application Japan, Jul. 26, 1978, 53/91046
Int. Cl.[3] B29C *27/20*
U.S. Cl. 29—447 8 Claims



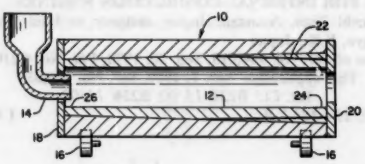
1. A method of making an elastic roller comprising the steps of forming a roller body by overlaying an axial core member with an elastic, liquid retentive layer of foam structure having uniform thickness surrounding the circumference of said core member; inserting the formed roller body into a sleeve of liquid permeable, flexible member having a total length larger than axial length of said roller body and having an inner diameter smaller than the outer diameter of said roller body; shrinking said sleeve at its portions extending beyond the both side ends of the inserted roller body along the both ends of said roller body while heating said portions; and folding back the free ends of said shrunk sleeve into a hollow room of said core member and securing said free ends onto the wall of said core member by pressure.

4,317,271

METHOD OF MAKING METAL TUBES

Bhaven Chakravarti, Hixson, Tenn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 19, 1979, Ser. No. 105,178
Int. Cl.[3] B22D *11/126*
U.S. Cl. 29—527.6 2 Claims

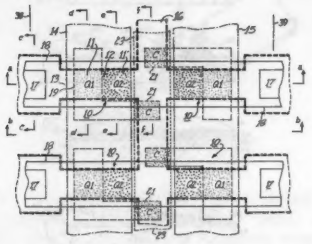


1. The method of making metal tubes including the steps of centrifugally casting a hollow metal muff by pouring molten metal into one end of a rotating mold, the inner diameter of which mold is tapered, with the smaller diameter being at the pouring end, the muff having a band of impurities extending from a point about midway between the ends, to the non-pouring end, the band starting midway between the ends at the outer surface, and running deeper as it moves towards the non-pouring end, removing the muff from the mold, machining the inner and outer surfaces of the muff so that it has an even inner and outer diameter throughout its entire length, sufficient material being removed from the outer surface such that substantially all of the band of impurities is removed.

4,317,272
HIGH DENSITY, ELECTRICALLY ERASABLE, FLOATING GATE MEMORY CELL

Chang-kiang Kuo, Houston, and Shyh-Chang Tsaur, Stafford, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 26, 1979, Ser. No. 88,708
Int. Cl.³ H01L *21/60*
U.S. Cl. 29—571 **6 Claims**



1. A method of making an electrically erasable programmable semiconductor memory cell of the floating gate type comprising the steps of:

forming heavily doped source and drain regions on opposite sides of a channel region in a face of a body of semiconductor material, the source and drain regions being covered with field oxide at said face,

applying a first layer of conductive material on said face separated from the channel region by thin gate oxide,

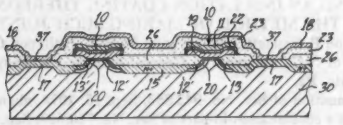
applying a second layer of conductive material on said face overlying the first layer but separated therefrom by an insulator coating, the second layer being patterned to define a control gate,,

applying a third layer of conductive material on said face overlying a part of the first layer but separated therefrom by an insulator coating which permits tunnelling, said part being over said field oxide.

4,317,273
METHOD OF MAKING HIGH COUPLING RATIO DMOS ELECTRICALLY PROGRAMMABLE ROM

Daniel C. Guterman, Houston, Tex., and David L. Henderson, Colorado Springs, Colo., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 13, 1979, Ser. No. 93,417
Int. Cl.³ B01J *17/00*; H01L *21/22, 21/26*; G11C *11/40*
U.S. Cl. 29—571 **7 Claims**



1. A method of making an electrically programmable semiconductor memory cell of the floating gate type comprising the steps of:

forming a first field oxide coating on a face of a body of semiconductor material, the first field oxide surrounding transistor areas on said face,

forming heavily doped source and drain regions on opposite sides of a channel region in said areas using a first mask,

forming a double-diffused doped region adjacent at least one side of said channel in each of said areas using a second mask smaller than said first mask,

the source and drain regions and the double-diffused regions being covered with a second field oxide at said face,

applying a first layer of conductive material on said face separated from the channel region by thin gate oxide,

patterning the first layer to partially define a floating gate which is much larger in area than said channel and extends out over said first field oxide by a substantial amount,

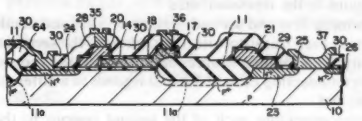
applying a second layer of conductive material on said face overlying the first layer separated therefrom by a thin insulator coating, and

thereafter patterning the second layer to define a control gate while at the same time patterning the first layer to define edges of the floating gate.

4,317,274
METHOD OF PRODUCING A SEMICONDUCTOR DEVICE

Kenjiro Yasunari, Hinode, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 28, 1979, Ser. No. 98,259
Claims priority, application Japan, Jan. 26, 1979, 54-7102
Int. Cl.³ H01L *21/28, 21/26*
U.S. Cl. 29—571 **8 Claims**



1. A method of producing an MOS integrated circuit device having a substrate electrode comprising the steps of:

forming a field insulating layer on a main surface of a semiconductor substrate so as to surround an active area where a transistor is to be formed, said field insulating layer being formed on said main surface except for a peripheral area of said main surface;

forming a thin insulating layer having a thickness smaller than that of said field insulating layer on said active and peripheral areas;

selectively forming a first conductive layer serving as a gate electrode on said thin insulating layer located on said active area, and simultaneously forming a second conductive layer on said thin insulating layer located on said peripheral area;

introducing an impurity of a conductivity type opposite to that of said semiconductor substrate into said substrate by using said first and second conductive layers and said field insulating layer as a mask, thereby to form in said active area at least one semiconductor region of a conductivity type opposite to that of said semiconductor substrate serving as a source or drain region;

removing said second conductive layer and said thin insulating layer located under said second conductive layer, thereby to expose a surface of said semiconductor substrate at said peripheral area; and

forming a metal layer on said exposed surface at said peripheral area, said metal layer serving as an electrode for said semiconductor substrate which makes ohmic-contact to said semiconductor substrate.

4,317,275
METHOD FOR MAKING A DEPLETION CONTROLLED SWITCH

Harold W. Dozier, Carrollton, Tex., assignor to Mostek Corporation, Carrollton, Tex.

Division of Ser. No. 840,679, Oct. 11, 1977, Pat. No. 4,204,131.
This application Jan. 10, 1980, Ser. No. 110,949
Int. Cl.³ H01L *21/26*
U.S. Cl. 29—571 **2 Claims**

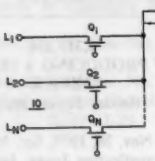
1. A method of making an integrated circuit device having a

switch for interconnecting a selected option line to a designated line comprising the steps:

(a) preparing a semiconductor substrate of a first conductivity type,

(b) forming a group of transistor sites in a portion of the substrate,

(c) treating the transistor sites according to a selected option so that at least one of the transistors formed therein will operate in the depletion mode and the transistors formed in the remaining sites in the group will operate in the enhancement mode,



(d) forming gate electrodes in operative proximity to channel regions in the transistor sites,

(e) forming first and second regions of a second conductivity type at each transistor site, the regions of the second conductivity type forming sources and drains of the transistors,

(f) interconnecting each of the first regions to a different option line, and

(g) interconnecting each of the second regions to the designated line.

4,317,276

METHOD OF MANUFACTURING AN INSULATED GATE FIELD-EFFECT TRANSISTOR THEREFORE IN A SILICON WAFER

Richard H. Heeren, Palatine, and Herbert A. Waggener, Mundelein, both of Ill., assignors to Teletype Corporation, Skokie, Ill.

Filed Jun. 12, 1980, Ser. No. 158,680
Int. Cl.³ H01L *21/225, 21/283*
U.S. Cl. 29—571 **7 Claims**

1. A method of manufacturing a device in a wafer with a semiconductor body of a first conductivity type, characterized by:

A. forming on a surface of the semiconductor body a layer of silicon dioxide doped with a second conductivity type dopant,

B. removing that portion of the doped silicon dioxide covering the interconnect work site area of the wafer.

C. forming a masking layer of an oxidation impervious medium over the wafer,

D. removing the oxidation impervious masking layer from the field areas of the wafer,

E. removing the doped silicon dioxide layer from field areas of the wafer so that multilayers of doped silicon dioxide and oxidation impervious medium overlay the source/drain areas and first level conductor areas of the wafer and a single layer of the oxidation impervious medium overlays the interconnect work site area of the wafer,

F. forming a layer of gate oxide over the gate area of the wafer,

G. forming a layer of conductive material over the entire surface of the wafer.

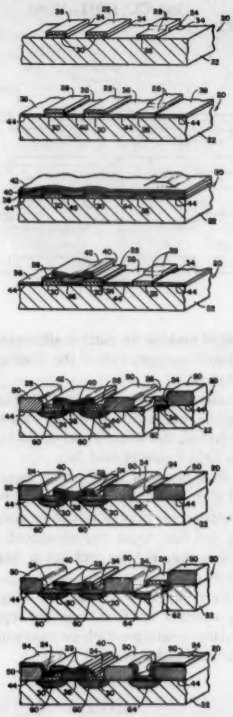
H. forming a layer of an oxidation impervious masking medium over the entire surface of the wafer,

I. removing the conductive material formed in Step G and the oxidation impervious masking medium in Step H from all areas of the wafer except the gate area of the wafer,

J. exposing the wafer to an elevated temperature so as to drive the dopant in the doped silicon dioxide layer formed in Step A into the underlying semiconductor body thus forming doped source/drain diffusions and doped first level conductor diffusions,

K. removing the masking medium formed in Step C from the interconnect work site area,

L. doping the interconnect work site area with a second conductivity type dopant,



M. forming a conductor over the entire surface of the wafer, and N. removing the conductor formed in Step M from all undesired portions of the wafer surface to form a desired pattern of electrical interconnections.

4,317,277

LOW RESISTANCE ELECTRIC JOINT BETWEEN CONDUCTIVE MEMBERS, AT LEAST ONE MEMBER HAVING AN INSULATION COATING THEREON, AND THE METHOD OF MAKING SUCH JOINT

Moreland P. Bennett, Hickory, and Louis F. Ettlinger, Conover, both of N.C., assignors to General Electric Company, Philadelphia, Pa.

Continuation of Ser. No. 942,853, Sep. 15, 1978, abandoned, which is a continuation-in-part of Ser. No. 720,637, Sep. 7, 1976, abandoned. This application Jul. 16, 1980, Ser. No. 169,341
Int. Cl.³ H01R *43/02*
U.S. Cl. 29—860 **12 Claims**

1. A method of joining at least two electrically conductive members which include bonded insulation thereon, comprising the steps of:

(a) interweaving a continuous conductor member about the insulated ends of said insulated conductive members;

(b) placing said insulated conductive members and said interwoven continuous conductor member into a highly conductive connector member with said continuous conductor member engaging the mating insulated surfaces of said insulated conductive members and the insulated sur-

faces of said insulated conductive members which mate with said highly conductive connector member, and

(c) subjecting said connector member to welding heat and pressure by welding electrodes with welding current flowing between said electrodes and spread across said interwoven conductor member, at least some of said welding current flowing through said continuous conductor

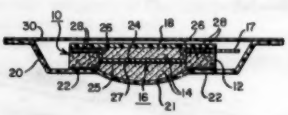
member melting some of said bonded insulation before said continuous conductor member makes electrical contact with said conductive members wherein said bonded insulation is burned away and portions of said continuous conductor member, said conductive members, and said highly conductive connector member melt to form a metallurgical bond.

4,317,278

METHOD FOR MANUFACTURING A DISPOSABLE ELECTRODE

Amiram Carmon, Haifa, Israel, and Daniel Lowe, Teaneck, N.J., assignors to Ipco Corporation, White Plains, N.Y.

Filed Jan. 8, 1980, Ser. No. 110,446
Int. Cl.³ H01R *43/00*
U.S. Cl. 29—878 **2 Claims**



1. The method of making a disposable electrode comprising the steps of:

placing in the bottom of a tray a plastic member with an aperture in a central region thereof through which is exposed the bottom of said tray,

placing a conductive layer on said plastic member so it extends into said central region of said plastic member,

pouring an electrode gel into said central region of said plastic member to contact the bottom of said tray, said electrode gel being poured at a temperature in excess of ambient temperature at which it is liquid and forming a cohesive, semi-rigid mass upon cooling to ambient temperature, sufficient electrode gel being poured that the semi-rigid mass is in contact with said conductive layer, and

sealing a cover to said tray with the plastic member, conductive layer and gel inside.

4,317,279

COAXIAL CABLE TRIMMER

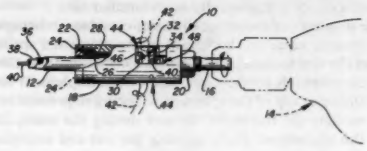
Robert R. Smith, Garland, and Guy H. Tippit, Greenville, both of Tex., assignors to E-Systems, Inc., Dallas, Tex.

Filed Aug. 21, 1979, Ser. No. 68,342
Int. Cl.³ B21F *13/00*
U.S. Cl. 30—90.1 **6 Claims**

1. Apparatus for trimming coaxial cable having a conductor, shielding, and insulation comprising:

housing means for supporting the cable in a substantially straight position;

means for rotating said housing relative to the cable, said means for rotating including connecting shaft means adjustably secured in said housing means for attachment to a drive;



first cutting means disposed in said housing means for cutting the shielding and the insulation; and

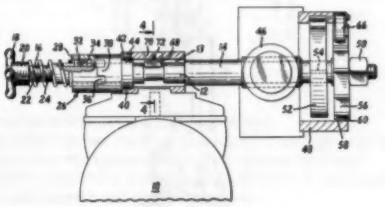
second cutting means attached to said connecting shaft means and disposed in said housing means for cutting the conductor.

4,317,280

POWER FEED APPARATUS FOR TOOLS

Adrian H. Krieg, Woodbridge, Conn., assignor to Widder Corporation, Naugatuck, Conn.

Filed Mar. 24, 1980, Ser. No. 132,822
Int. Cl.³ B23D *21/06*
U.S. Cl. 30—92 **5 Claims**



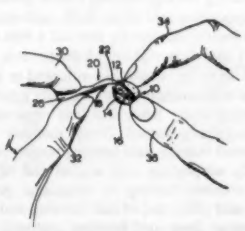
1. Apparatus for power feeding a tool comprising a shaft, means for mounting said tool to said shaft, energy storage means connected to said shaft and to a fixed reference, clutch means on said shaft and the tool mounting means, said clutch means being operative to drivingly engage said tool and said shaft and disengageable to permit said shaft to rotate with respect to said tool mounting means.

4,317,281

NUT OPENER

Anthony Yowa, 4633 Skyline Dr., Ft. Collins, Colo. 80526

Filed Feb. 25, 1980, Ser. No. 124,639
Int. Cl.³ A47J *43/26*
U.S. Cl. 30—120.2 **4 Claims**



1. An implement for opening pistachio nuts or the like comprising:

an elongated spoon bowl having a sharply pointed front tip portion;

a generally semi-circular tab connected to the rear portion of and centered on the center line of the spoon bowl;

the edge margins of the rear portion of the spoon bowl flaring outwardly and smoothly merging with the edge margin of the generally semi-circular tab;

the diameter of the generally semi-circular tab being approximately equal to the length of the elongated spoon bowl;

and the top surface of the generally semi-circular tab, which corresponds to the same side of the implement as that of the open top of the spoon bowl, being depressed to accommodate the thumb of the user during the manipulation of the implement while opening the nut and scooping outer therefrom the nutmeat.

4,317,282

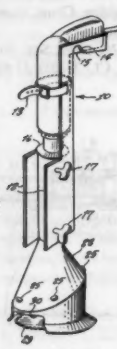
WOOD SANDING, GRASS AND WOOD CUTTING ELECTRIC DRILL ATTACHMENT DEVICE

Paul D. Pace, 347 72nd St., Brooklyn, N.Y. 11209

Filed Jun. 30, 1980, Ser. No. 164,180

Int. Cl.³ A01D *53/12;* **B23B** *45/14;* **B24B** *23/06*

U.S. Cl. 30—122 **4 Claims**



1. A wood sanding, grass and wood cutting electric drill attachment device comprising a pair of side panels for mounting to an electric drill, each of said side panels having a first right-angled portion for projection forwardly of a drill when said side panels are mounted to a drill, said right-angled protion comprising a slot formed therethrough; a belt fastening means for fastening said first portions of said side panels to a drill, said belt fastening means extending through each said slot, and fastens said side panels to a drill by enveloping the circumference of a drill at an optimal location; an elongated housing mounted between and within said second elongated portions of said pair of side panels; means for securing said housing therein; a main shaft rotatably mounted in said housing, said housing having bearing means positioned therein for rotatably supporting said main shaft, said main shaft having a first end projecting outwardly beyond a first end of said housing adjacent said first right-angled portions, said first end of said main shaft being receivably mounted in a chuck of a drill, and a second end projecting substantially beyond the other end of said housing away from said first right-angled portions; a truncated conically-shaped hood member having bearing means mounted therein; said bearing means of said hood member rotatably supporting said second end of said main shaft, said hood member having its truncated portion positioned adjacent to said other end of said housing and flares outwardly therefrom away from said housing and said side panels, said hood member defining as angled attachment surface at the base thereof of elliptical cross-section whereby special attachment for cutting and sanding may be connected to a power drill for operation thereby.

4,317,283

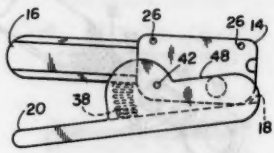
STRIPPER TOOL

Harry P. McDiarmid, Central Islip, and Peter J. Mihelich, Farmingdale, both of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Aug. 28, 1980, Ser. No. 182,112

Int. Cl.³ H02G *1/12;* **B26F** *3/00*

U.S. Cl. 30—164.9 **12 Claims**



1. A tool for scribing a surface, said tool comprising:

first and second pivotally connected members, said first member having an arm and a body with an opening with a scribing means across one edge of said opening extending thereinto a limited distance only, said second member having an arm and a channel; and

spring means between said arm of said first member and said arm of said second member to bias same apart from each other to cause said channel of said second member to close over the body of said first member and cover said opening.

4,317,284

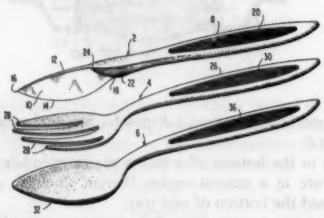
FLATWARE EATING UTENSILS

William A. Prindle, 651½ Maple Ave., New Martinsville, W. Va. 26155

Filed Mar. 21, 1980, Ser. No. 132,709

Int. Cl.³ A47G *21/06;* **B26B** *3/02*

U.S. Cl. 30—340 **11 Claims**



1. A knife, comprising a generally flat longitudinally extending blade and a generally flat longitudinally extending handle, said blade being substantially vertical and being centrally positioned with respect to the longitudinal centerline of the handle, said handle being substantially horizontal and having a width which is substantially greater than its thickness, said blade lying perpendicular to the generally flat handle and being provided with a lower cutting edge, said handle having a forward portion which overlies and is connected to the blade, said blade having at least a rear portion which underlies and is connected to the handle.

4,317,285

BRUSH CUTTING ATTACHMENT FOR CHAIN SAW

William W. Graham, 1275 Castlehill Crescent, Ottawa, Ontario, Canada K2C 2B2

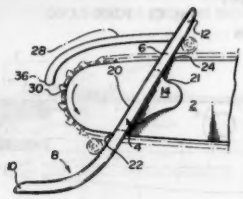
Continuation-in-part of Ser. No. 115,354, Jan. 25, 1980, Pat. No. 4,270,272. This application Mar. 26, 1981, Ser. No. 247,720

Int. Cl.³ B27B *17/02*

U.S. Cl. 30—371 **17 Claims**

1. An attachment for a direct drive gasoline or electric

powered chain saw comprising a rigid bar of round cross-section to be secured to the blade of the chain saw at a point spaced a short distance towards the handle from the tip of the blade, the bar, when so secured substantially lying in a plane parallel to the plane of the blade and having a straight portion traversing the blade at an angle to the longitudinal axis of the blade forwardly and downwardly extending with respect thereto and projecting upwardly and rearwardly in a straight line beyond the upper edge of the blade; the bar having another



portion projecting beyond the lower edge of the blade, this other portion being gradually curved through an arc ending in a direction substantially parallel to the longitudinal axis of the blade slightly forwardly of the blade, and means positioned on the bar substantially centrally between its ends to secure the bar to the blade; and comprising, in addition, a kickback guard consisting of an elongated, rigid member secured to the bar and extending forwardly therefrom, to be spaced from the upper front cutting surface of the chain saw and shield that portion of the surface from operative engagement with material to be cut.

4,317,286

PHOTOGRAMMETRIC APPARATUS

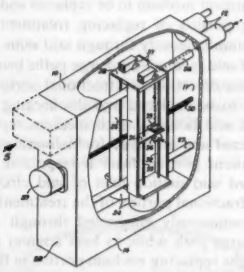
Michael H. Elfick, Cary Bay, and Michael J. Fletcher, Killara, both of Australia, assignors to The University of Newcastle Research Associates Ltd., Australia

Filed Dec. 5, 1979, Ser. No. 100,425

Claims priority, application Australia, Dec. 14, 1978, PD7118; Mar. 13, 1979, PD7993

Int. Cl.³ B43L *13/16*

U.S. Cl. 33—1 A **12 Claims**



1. An apparatus for use in photogrammetry and which comprises:

means defining two scanning zones which are located in spaced-apart substantially parallel relationship;

mounting means for mounting each photograph of a stereoscopic pair of photographs to a respective one of said means defining said two scanning zones in such a manner that each of the photographs is in a respective said scanning zone;

an optical scanning system for scanning said two scanning zones and for projecting images of the respective photographs when mounted in said zones along image projection paths defined by said optical scanning system and associated with respective ones of said scanning zones; and

means for optically superimposing reference marks on the projected images;

said optical scanning system comprising:

means for simultaneously scanning said two scanning zones in a first direction parallel to said scanning zones;

means for scanning said scanning zones relative to each other in said first direction; and

means for independently scanning said two scanning zones in a second direction which is parallel to said scanning zones but orthogonal to said first direction.

4,317,287

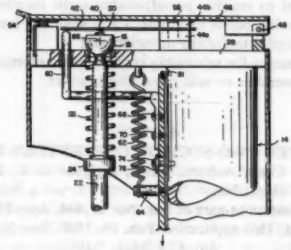
MICROIDENTIFICATION SYSTEM

George J. H. Sausele, 15 Apple Hill, Lynnfield, Mass. 01940

Filed Sep. 10, 1979, Ser. No. 73,701

Int. Cl.³ B43L *13/10*

U.S. Cl. 33—24 R **8 Claims**



1. A microidentification system comprising

A. a resilient carrier-card for supporting a workpiece to be engraved a workpiece mounted on said carrier-card,

B. a scriber selectively actuable into contact with said workpiece to engrave information thereon,

C. means mounting said carrier-card for engaging said workpiece in scribing contact with said scriber,

D. means forming a finger biased to engage said card and resiliently deform it to disengage said workpiece from said scriber when said workpiece is not to be inscribed, and

E. means for disengaging said finger from said carrier-card when said workpiece is to be inscribed.

4,317,288

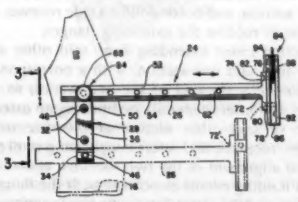
ARCHERY MOUNTING DEVICE AND SIGHT SUPPORT

Shozui Yasui, Tokyo, Japan, assignor to M. Yasui & Co. Ltd., Tokyo, Japan

Filed Dec. 27, 1979, Ser. No. 106,885

Int. Cl.³ F41G *1/46*

U.S. Cl. 33—265 **6 Claims**



1. A mounting device and sight support adapted to be mounted on an archery bow for visually aiming an arrow at a target wherein said bow includes a handle member having a vertical axis and limbs including tips, said limbs extending from said handle in opposed directions and a bow string extending

between the respective limb tips, said mounting device and sight support including:

a mounting bracket adapted to be fixedly secured to either side of said handle member and having a plurality of predetermined vertically aligned spaced apart mounting positions and including a plate having a relatively flat back wall for contacting said handle, a front wall parallel to said back wall broken by a plurality of protrusions extending outwardly of said front wall forming said mounting positions, and each of said protrusions having a threaded bore extending into said plate;

an elongated attachment member having predetermined horizontal mounting positions for securing said member to one of said mounting positions on said bracket dependent upon the trajectory desired for said arrow during flight, and said elongated attachment member having a free end and an opposite end terminating in end attaching means for a sight mechanism;

a sight support attached to said end attaching means and said sight support includes a vertical elevation sight guide bar extending parallel to said vertical axis of said handle and adapted to receive an adjustable sight member and said sight guide bar is of a length less than the length of said elongated attachment member; and

locking means for releasably retaining said elongated attachment member to said mounting bracket.

4,317,289

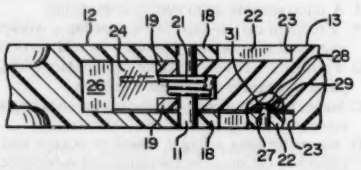
PIVOTED TWO-SECTION CARPENTER'S LEVEL

Bartley R. Conn, Auburn, Calif., assignor to U. D. P., Inc., Incline Village, Nev.

Continuation-in-part of Ser. No. 31,464, Apr. 19, 1979, abandoned. This application Feb. 19, 1980, Ser. No. 122,736

Int. Cl.³ B43L *7/06*

U.S. Cl. 33—498 **5 Claims**



1. An adjustable carpenter's level, comprising:

a pair of straight sections similar in dimensions of height and width, including a main section and an adjustable section;

pivoting means connecting the sections together flushly and providing for pivoting movement of the adjustable section with respect to the main section, from a position of linear alignment of the two sections through at least 90°;

a level bubble in at least the main section, indicating horizontal position;

a pair of flanges extending lengthwise from one section, flush with the sides of said one section and overlapping the other section, and corresponding side recesses in the other section to receive the extending flanges;

a projecting insert extending from said other section centrally into said one section, with a corresponding recess positioned in the end of the one section to receive the insert, said insert generally comprising an extension of the width of said other section at the side recesses, said flanges, recesses, and insert cooperating to provide stability and alignment of the two sections; and

position holding means associated with the flanges, the side recesses and the insert for holding the sections at selected angles, including a right-angle position, comprising a projection extending from the inside face of at least one of the flanges, inwardly toward the projecting insert and side recess of the other section, said insert and side recess having depressions for receiving and seating the projections at said selected angles, and including means urging the projection into the depressions.

4,317,290

HEAT TREATMENT APPARATUS

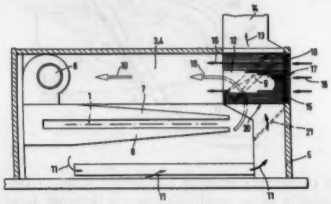
Gerhard Voswinckel, Aachen, Fed. Rep. of Germany, assignor to H. Krantz GmbH & Co., Aachen, Fed. Rep. of Germany

Filed Sep. 16, 1980, Ser. No. 187,784

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1979, 7928210[U]

Int. Cl.³ F26B *13/02*

U.S. Cl. 34—86 **6 Claims**



1. An apparatus for the substantially continuous heat treatment of a material passing through a plurality of treatment zones using a heated gaseous treatment medium conducted in a substantially closed circuit operatively interconnecting said zones, comprising: housing means enclosing said plurality of treatment zones, said housing means having an inlet opening and an outlet opening for each treatment zone, said housing means further including substantially closed circuit path means for treatment medium flow through each treatment zone; means for circulating a treatment medium through said substantially closed circuit, said treatment medium circulating means having a suction inlet and a pressure outlet, at least one heat exchange means for each zone mounted inside said housing means in operative relation to said respective housing inlet and outlet openings, said heat exchange means defining in each treatment zone a medium replacement flow path and a medium discharge cross flow path in operative heat exchanger relationship relative to each other and in such position that a fractional portion of treatment medium to be replaced and a substantially corresponding portion of replacing treatment medium pass continuously simultaneously through said same heat exchange means; each of said medium discharge paths being constructed and arranged for diverting said fractional portion of the treatment medium to be replaced and discharging the fractional portion out of said housing, each medium replacement path being constructed and arranged for delivering said replacing treatment medium portion from a respective housing inlet opening toward said suction inlet of said circulating means, whereby said fractional portion of the treatment medium to be replaced is continuously eliminated through the respective medium discharge path while its heat content is substantially transferred to the replacing medium portion in the replacement path in each treatment zone inside said housing means.

4,317,291

ROTATABLE DRUM DRIVE

Marinus H. Weststrate, and Jan Willemsen, both of Lisse, Netherlands, assignors to Expert N.V., Curacao, Netherlands Antilles

Continuation of Ser. No. 766,550, Feb. 7, 1977, abandoned. This application Nov. 5, 1979, Ser. No. 90,999

Claims priority, application Netherlands, Feb. 19, 1976, 7601719; Oct. 19, 1976, 7611558; Oct. 19, 1976, 7611560

Int. Cl.³ F27B *7/26*

U.S. Cl. 34—103 **11 Claims**

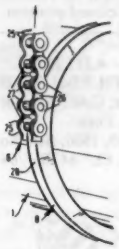
1. A device for treating solid and/or liquid materials, partic-

ularly for cooling and drying mold sand and for cooling castings, which comprises in combination:

a substantially horizontal drum adapted to receive material to be treated, a plurality of collars disposed in longitudinally spaced relation on said drum, each collar having a smooth, flat and toothless cylindrical surface and said collars being disposed in parallel, coaxial relation to each other;

means engaging said collars for supporting the entire weight of said drum and the contents thereof, said means comprising a frame, at least one drive sprocket mounted for rotation on said frame about a horizontal axis and an endless chain passing over said drive sprocket and having a depending bight portion engaging a portion of the cylindrical surface of one of said collars in slip-free contact therewith to suspend a corresponding portion of the weight of said drum and contents thereof, said drive sprocket being positioned such that said collars are disposed in parallel, vertical planes and said one collar is disposed in a vertical plane also containing said drive sprocket; and

drive means for rotating said drive sprocket correspondingly to rotate said drum through the slip-free contact between said chain and said one collar.



4,317,292

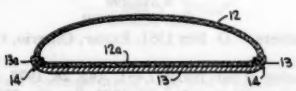
SLIPPER SOCK AND METHOD OF MANUFACTURE

Florence Melton, 1000 Urlin Ave., Columbus, Ohio 43212

Division of Ser. No. 100,228, Dec. 4, 1979, Pat. No. 4,276,671. This application Oct. 22, 1980, Ser. No. 199,447

Int. Cl.³ A43B *1/02;* A43D *9/00*

U.S. Cl. 36—9 R **6 Claims**



1. A stretchable slipper sock which conforms to the shape of the wearer's foot and is washable, said sock comprising:

a knitted stretchable sock which includes an upper portion and a foot portion, said foot portion having a unitary stretched bottom; and

a thin, flexible bottom sole having a shape and size corresponding to the shape and size of the stretched bottom of said foot portion of said knitted sock, said bottom sole being stitched around its periphery to said stretched bottom of said sock foot portion, such that said bottom sole has a tapered periphery.

4,317,293

FOOT-SUPPORTING INSOLE

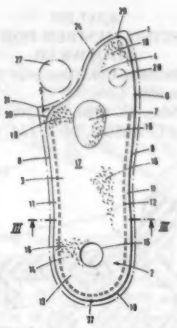
Rolf Sigle, Friedrich-Siller-Strasse 36, D-7014 Kornwestheim, and Jakob Sigle, Rechbergweg 3, D-7302 Ostfildern, Kemnat, both of Fed. Rep. of Germany

Filed Feb. 22, 1980, Ser. No. 123,618

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1979, 2908019

Int. Cl.³ A43B *13/38, 19/00*

U.S. Cl. 36—43 **16 Claims**



1. A foot-supporting insole made of a resiliently flexible material of substantially constant thickness over its entire area, said insole being curved upwardly at the inside of the foot for supporting the arch of the foot and having a stiffness at least at the outside zone of the foot, said insole extending from the heel zone up to an S-shaped front bounding line which extends generally obliquely to the longitudinal axis of the foot and substantially perpendicular to the inner and outer edges of the insole at both its start and end such that the S-shaped bounding line passes in front of the ball of the little toe at the outside of the foot and behind the ball of the big toe on the inside of the foot, whereby during rolling motion when walking the foot is turned towards the big toe.

4,317,294

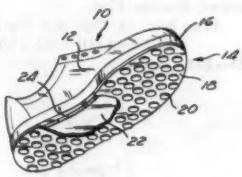
REPLACEABLE SHOE SOLE

Mark V. Goodyear, 3614 S. Marine, Santa Ana, Calif. 92704

Filed May 20, 1980, Ser. No. 151,628

Int. Cl.³ A43B *3/24, 21/36*

U.S. Cl. 36—100 **10 Claims**



1. An athletic shoe adapted to receive interchangeable, treaded bottom surfaces which are suitable for use in a variety of athletic activities, comprising:

an upper shoe portion to receive the foot of the user of said athletic shoe;

a mid-sole securely attached to the bottom surface of said upper shoe portion, said mid-sole having a substantially continuous groove recessed into the bottom surface of said mid-sole with an opening thereon; and

an out-sole removably attached to and superimposed on said mid-sole to form a unitary sole on said athletic shoe, said out-sole comprising:

a treaded bottom surface to provide traction to said shoe; and

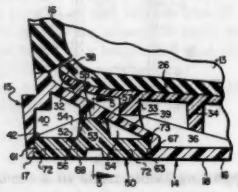
a substantially continuous ridge formed on a top surface of said out-sole, said ridge being aligned with and inserted into said groove in said mid-sole to provide snap-fit engagement means between said mid-sole and said out-sole for removably attaching said out-sole to said mid-sole and for selectively permitting removal and replacement of either said out-sole or other similarly constructed out-soles.

4,317,295

WEAR RESISTING MEMBER FOR ARTICLE OF FOOTWEAR

Chris A. Hanson, Boulder, Colo., assignor to Hanson Industries Incorporated, Boulder, Colo.

Filed Mar. 13, 1980, Ser. No. 130,196
Int. Cl.³ A43B 5/04, 21/24, 13/22
U.S. Cl. 36—117 **10 Claims**



1. In an article of footwear having a sole portion having a cavity therein, said portion also having a bottom wall having an undersurface adapted to engage a support surface, the improvement of a wear resisting member carried by said bottom wall for reducing wear on the undersurface of said portion when the wearer of said footwear is walking on a rough or other abrasive surface;

said bottom wall of said portion having an opening therein, and said wear resisting member being shiftably mounted in said opening; and,

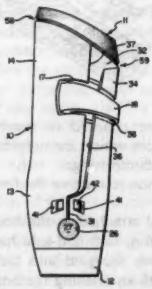
said cavity being defined in part by an upper wall spaced above said bottom wall, said upper wall serving to support at least part of said wearer's foot, and said wear resisting member extending upwardly through said cavity and engaging said upper wall.

4,317,296

BOOT SHELL AND LINER

Chris A. Hanson, Boulder, Colo., assignor to Hanson Industries Incorporated, Boulder, Colo.

Filed Mar. 13, 1980, Ser. No. 130,197
Int. Cl.³ A43B 5/04, 21/00
U.S. Cl. 36—121 **15 Claims**



1. In an article of footwear of the class described, the improvement comprising an integral one-piece outer shell molded from a relatively rigid plastic material and including a sole portion at the bottom of the shell, a tubular cuff portion at the top of the shell, and an intermediate foot and ankle enclosing portion; said shell having a single split extending generally lengthwise from the top of said cuff portion and terminating above said sole portion, and the regions of the shell adjoining the split being shaped to provide a pair of curved flap members overlapping to a substantial extent so as to provide a substantially closed shell encircling the ankle of a wearer's foot; said flap members being resiliently spreadable to facilitate insertion or removal of a foot through said cuff portion; and closure means mounted on said shell for releasably retaining said flap members in overlapping closed position.

4,317,297

FOOTWEAR WITH ADJUSTABLE FLEXURE

Chris A. Hanson, Boulder, Colo., assignor to Hanson Industries Incorporated, Boulder, Colo.

Filed Mar. 13, 1980, Ser. No. 130,199
Int. Cl.³ A43B 5/04
U.S. Cl. 36—121 **5 Claims**

1. A ski boot with means for flexing said boot comprising:

a shell having closure means adapted for closing said shell about the foot and lower leg area of a skier;

a vamp portion of said shell extending upwardly in the instep area of said boot;

an upper boot portion of said shell extending from said lower leg area downwardly to overlie said vamp portion in the instep area of said boot;

a joint in said boot defined in the boot instep area between said vamp portion and said overlying upper boot portion; and

said upper boot portion including a lower split section having an opening at said joint,

said lower split section including a slit in said upper boot portion commencing at said joint, extending upwardly, and terminating in said upper boot portion,

whereby said boot may be flexed at said instep area without loosening the top portion of the boot.

4,317,298

ICE SCRAPER

Harry Mathers, P.O. Box 1351, Exeter, Ontario, Canada N0M 1S0

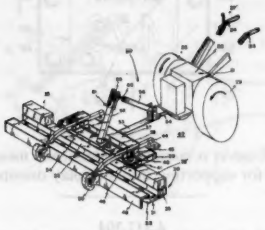
Continuation of Ser. No. 937,451, Aug. 28, 1978, abandoned. This application Jan. 30, 1981, Ser. No. 229,892
Claims priority, application Canada, Aug. 4, 1978, 308776
Int. Cl.³ E01H 5/00
U.S. Cl. 37—41 **4 Claims**

1. An ice scraper blade assembly adapted to be propelled over a sheet of ice by driving means for removing surface irregularities from the ice, said assembly comprising:

(a) a frame having a linear connector bar for pivotal connection at one end to said driving means, a cross member adjacent to the other end of said connector bar and normal thereto;

(b) a longitudinal carriage parallel with and pivotally secured to said cross member;

(c) an ice scraping blade having a straight, cutting forward edge secured to said longitudinal carriage;
(d) adjusting means connecting the carriage with said connector bar for pivoting said carriage and blade to a preferred scraping angle on the ice;
(e) said carriage being adapted to receive weights to increase the pressure of the cutting blade on the ice;



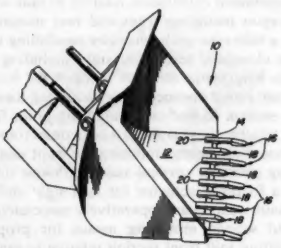
(f) the pivotal connection of the connector bar to said driving means having its axis intersecting the horizontal axis of the forward wheels of said driving means; and
(g) means for selectively setting and maintaining the frame and cutting blade at an angle relative to the path of travel of said driving means.

4,317,299

TOOTH ARRANGEMENT FOR EARTHWORKING IMPLEMENT

Francis C. Funk, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Jun. 30, 1980, Ser. No. 164,113
Int. Cl.³ E02F 9/28
U.S. Cl. 37—141 T **2 Claims**



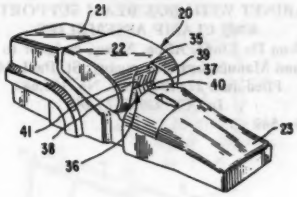
1. In an earth-working tool having an elongate cutting blade provided with a leading cutting edge and a plurality of teeth secured to the blade and projecting forwardly of the cutting edge, the teeth being of an improved arrangement comprising: a plurality of equispaced primary and secondary teeth arranged in alternating fashion across the cutting blade with adjacent ones of the primary and secondary teeth being spaced from each other so as to leave spaced sections of the blade which are free of teeth; said primary teeth including forward digging portions which are generally wedge-shaped in side view whereby they act to lift material and are located forwardly of the secondary teeth; and said secondary teeth including forward digging portions which are generally wedge-shaped in plan view whereby they move soil sideways into voids created by the primary teeth.

4,317,300

EARTH WORKING TOOTH WITH WEAR CAP

Robert K. Emrich; William H. Prather, and John M. Burkhart, all of Portland, Oreg., assignors to ESCO Corporation, Portland, Oreg.

Continuation-in-part of Ser. No. 77,297, Sep. 20, 1979, abandoned. This application Dec. 29, 1980, Ser. No. 220,283
Int. Cl.³ E02F 9/28
U.S. Cl. 37—142 R **16 Claims**



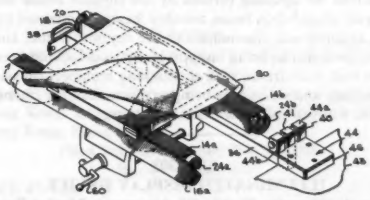
1. An earth-working tooth comprising an elongated adapter having a point-receiving part at its forward end and means at the rear end for securing said adapter to earth working equipment, a wear cap removably mounted on a generally horizontally extending surface of said adapter, and a point removably mounted on said adapter part maintaining said wear cap in place of said adapter, said wear cap having a central forwardly facing wall flanked by forwardly extending projection along the cap sides, rail lock means interconnecting said cap and adapter rearwardly aligned with said projections and including parallel recesses in the sides of said adapter adjacent to but spaced vertically of said adapter surface and providing parallel generally horizontally extending bearing surfaces, said wear cap having parallel side wings received in said recesses, said wings providing parallel bearing surfaces arranged to contact said recess bearing surfaces, and said projections diverging forwardly from said forwardly facing wall.

4,317,301

APPARATUS FOR STRETCHING FABRIC

Harold R. Timphony, and Rene F. DeCastro, both of Gretna, La., assignors to Nifty Enterprises, Inc., Gretna, La.

Filed May 13, 1980, Ser. No. 150,405
Int. Cl.³ D06C 3/08
U.S. Cl. 38—102 **11 Claims**



1. Apparatus for disposing and stretching fabric about a frame of a configuration having opposed lateral edges, a front surface about which the fabric is to be disposed, and a rear surface, the fabric having opposing peripheral edges, said apparatus comprising:
first and second fabric locking means for releasably receiving and securing thereto the opposing edges of the fabric with the fabric disposed about the front surface of the frame, each of said first and second fabric locking means comprising a support surface for supporting the rear surface of the frame, and means for releasably receiving and securing an edge of the fabric so that the fabric is disposed against the rear surface of the frame; and
means for independently supporting each of said first and

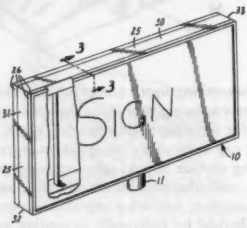
second fabric locking means and variably disposing said first and second fabric locking means towards and away from each other whereby said first and second fabric locking means are disposed so that their support surfaces may support frames of varying size and so that the fabric secured in each of said fabric locking means is stretched about the frame as said first and second locking means are disposed to stretch the fabric about the frame.

4,317,302

SIGN CABINET WITH BOX BEAM SUPPORT FRAME AND CLAMP ASSEMBLIES

Dennis J. Von De Linde, Afton, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 27, 1980, Ser. No. 163,642
Int. Cl.³ G09F *13/00*
U.S. Cl. 40—549 **20 Claims**



1. A sign cabinet for supporting a flexible sign face under tension comprising:

(a) a rectangular main frame having top, bottom and side spans in opposed relationship, the spans being formed of sheet material having an integral angularly inclined plate positioned along the major portion of at least one edge of said sheet material and having a locking member at the free end of said plate,

(b) a support frame formed by box beam members disposed and connected to form a top, bottom and sides of said support frame, each beam member having four walls and having a race integral with one side wall thereof and in such position being symmetrical about the central axis of said support frame with the races in the beam members being in opposing relationship for positioning a plurality of means to secure said flexible sign face under tension across the opening formed by the support frame and one wall of each box beam member having a channel to form a symmetrical channel about the support frame, and said support frame being supported by said locking members to said main frame with the locking members on said top, bottom and side spans being positioned in the channel on the walls of said box beam members.

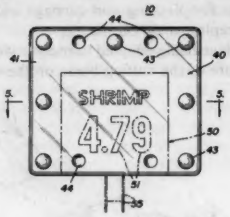
4,317,303

ILLUMINATED DISPLAY DEVICE

Morton A. Sernovitz, Skokie, Ill., assignor to Market Products, Inc., Skokie, Ill.

Filed Feb. 17, 1981, Ser. No. 235,147
Int. Cl.³ G09F *13/04*
U.S. Cl. 40—564 **9 Claims**

1. An illuminated display device comprising an openfront housing having a rear wall and a peripheral side wall structure, said rear wall having first projections thereon extending forwardly therefrom, a circuit board disposed within said housing in engagement with said first projections, electric illumination means carried by said circuit board and adapted to be connected to an associated source of electric power, a transparent cover mountable on said housing for closing the open front thereof while permitting visibility of said illumination means, said cover having second projections thereon extending rearwardly therefrom for cooperation with said first projections firmly to position said circuit board therebetween in said housing when said cover is mounted thereon, and means carried by said housing for supporting it in a display orientation.

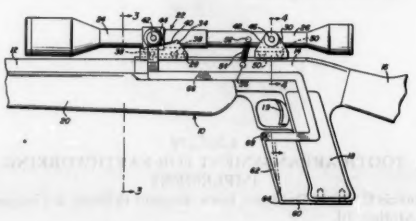


4,317,304

RANGE AND ELEVATION ADJUSTMENT FOR TELESCOPIC SIGHT

James S. Bass, 6009 McGregor Blvd., Fort Myers, Fla. 33901

Filed Jan. 3, 1980, Ser. No. 109,325
Int. Cl.³ F41G *1/38*
U.S. Cl. 42—1 ST **7 Claims**



1. In combination with a weapon including means for projecting a missile therefrom along a predetermined trajectory path in predetermined orientation relative to said weapon and with said weapon including front and rear mounting points spaced along a reference path generally paralleling said trajectory path, an elongated telescopic sight including front and rear relatively lengthwise shiftable sections for focusing said sight at different range distances, first mounting means mounting said rear section to said rear mounting point for angular displacement relative thereto about a horizontal transverse axis and second mounting means mounting the front section to said front mounting point for vertical and lengthwise shifting relative thereto, a focusing actuator for said sight shiftably supported from said weapon and operatively associated with said sight and said second mounting means for proportionally lengthwise shifting said front section relative to said rear section and vertically shifting said front section relative to said second mounting means in a manner whereby the focused range on the optical axis of the telescopic sight is disposed at the same elevation as the same range distance along said trajectory path from said weapon.

4,317,305

ARTIFICIAL LURE

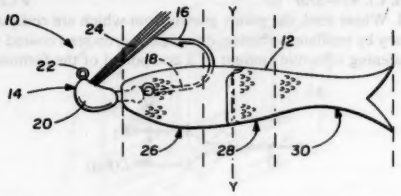
Herman P. Firmin, Baton Rouge, La., assignor to Knight Manufacturing Company, Inc., Tyler, Tex.

Filed Jul. 28, 1980, Ser. No. 173,188
Int. Cl.³ A01K *85/00*
U.S. Cl. 43—42.24 **9 Claims**

1. An artificial lure comprising:

an integral resilient elongate body forming a lure and having a head portion, a mid-body portion, and a tail portion

along its length, said mid-body portion extending rearwardly from said head portion and decreasing in thickness in a first dimension to form a hinge section and increasing in thickness in the first dimension in the region of said hinge section to form side fins extending outwardly and forwardly toward said head portion forming recesses on either side of the body adjacent said hinge section, said



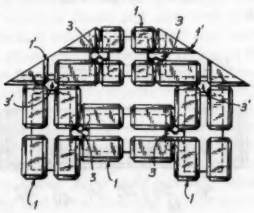
side fins extending generally along the height of said mid-body portion and being positioned to interfere with the flow of water past said body as the lure is drawn through water in order to cause oscillation of said tail portion, said tail portion extending rearward of said mid-body portion and of said protrusions and oscillating in a manner resembling the motion of a living creature as the lure is drawn through water.

4,317,306

BUILDING BLOCK ASSEMBLY

Martti Hotti, 44710 Taimoniemi, Finland

Filed Jul. 11, 1980, Ser. No. 167,918
Int. Cl.³ A63H *33/10*
U.S. Cl. 46—26 **6 Claims**



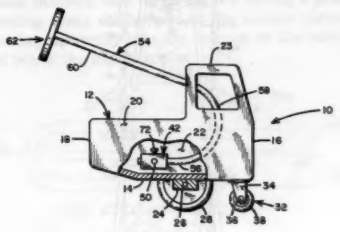
1. In a building block assembly including a plurality of prismatic building blocks, each building block having at least one substantially rectangular face portion in which a pair of substantially mutually orthogonal intersecting grooves are formed, said grooves opening onto said respective face portions; and a plurality of connecting elements, each of said connecting elements having at least one sheet-like flexible connecting portion receivable within said grooves, the improvement comprising: said at least one connecting portion of each connecting element having a transverse bowed configuration wherein the depth of said bowed configuration is greater than the width of said grooves formed in said block face portions while the thickness of said connecting portion is less than the width of said grooves and wherein the height of said connecting portion at a mid region thereof is smaller than the height at the end regions thereof.

4,317,307

WALK BEHIND, STEERABLE WHEELED TOY

Raymond F. Conry, 4701 Aberdeen Rd., Mound, Minn. 55364

Filed Sep. 2, 1980, Ser. No. 182,964
Int. Cl.³ A63H *30/00*
U.S. Cl. 46—210 **3 Claims**



1. A walk behind toy comprising;
a base having a fore and aft axis;
a pair of spaced wheels disposed on said base, laterally of said fore and aft axis for rotation about a horizontal axis substantially perpendicular to said fore and aft axis;
a transverse bearing block supported above said base, for pivotal or rocking movement about a transverse axis, said bearing block including a bore extending in a fore and aft direction;
a torsionally rigid steering column having a first generally horizontal tubular portion pivotably disposed in the bore in said bearing block, and a second portion inclined upwardly at an angle relative to said first portion;
means drivably coupling the first portion of said steering column to the bore in said bearing block; and
a steering wheel affixed to the upper end of the second portion of said steering column whereby the base is free to rotate about the horizontal axis of rotation of said wheels while rotating about a vertical axis of said base.

4,317,308

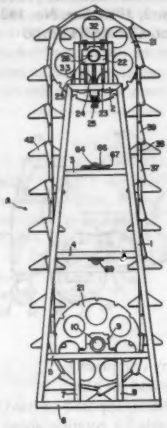
METHOD AND APPARATUS FOR PLANT CULTIVATION

Bruce I. C. Derrick, and Jack B. Geaslin, both of Hong Kong, Hong Kong, assignors to Agribusiness Enterprises Limited, Hong Kong, Hong Kong

Filed Feb. 8, 1980, Ser. No. 119,928
Int. Cl.³ A01G *1/04*
U.S. Cl. 47—1.1 **51 Claims**

1. A method of plant cultivation for increasing the bed area to floor area ratio of multi-tier plant cultivation apparatus in an environment in which air stagnation ordinarily limits the normal vertical separation between the top and bottom tiers to a limiting distance at which the ambient air temperature differential between the top and bottom tiers is smaller than a limiting temperature differential inimical to plant cultivation, comprising the steps of:
providing a plurality of said tiers, with the top and bottom tiers having a vertical separation which is greater than said limiting distance; and
moving said tiers about a generally vertical endless path at a speed rapid enough to cause air movement from paddling action of said tiers sufficient to improve air circulation and

reduce the ambient air temperature differential between the top and bottom tiers below said limiting temperature



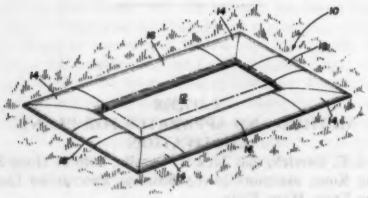
differential despite the greater vertical separation between said top and bottom tiers.

4,317,309

PLANT GROWTH SUPPRESSION DEVICE

Steve S. Sheldon, 18 Steiner Blvd. Barboursville, W. Va. 25504

Filed May 16, 1980, Ser. No. 150,902
Int. Cl.³ A01G *1/08*
U.S. Cl. 47—32 **11 Claims**



1. An apparatus for suppressing plant growth within a predetermined ground region surrounding a monument or the like, comprising:

(a) a shield member having a plurality of shield pieces covering the predetermined ground region, thereby eliminating undergrowth through deprivation of air and sunlight; and

(b) means for coupling together said shield pieces, said coupling means including longitudinal track means projecting downwardly from a lower surface of each shield piece, said coupling means further including a coupling plate capable of sliding retention within said track means, the entire coupling plate being substantially flat to enable said coupling plate to securely interfit with said track means and lower surfaces of adjacent shield pieces for coupling together said shield pieces when said coupling plate is positioned across an interface between adjacent pieces.

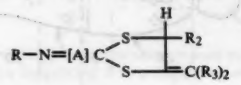
4,317,310

SUBSTITUTED 2-IMINO-1,3-DITHIO AND 1,3-OXATHIO HETEROCYCLIC COMPOUNDS AS HERBICIDAL ANTIDOTES

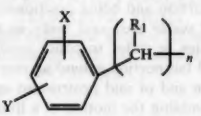
Frederic G. Bollinger, Creve Coeur, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 960,987, Nov. 15, 1978, Pat. No. 4,231,783. This application Jul. 21, 1980, Ser. No. 170,506
Int. Cl.³ A01C *1/06, 21/00*
U.S. Cl. 47—57.6 **9 Claims**

1. Wheat seed, the plants grown from which are resistant to injury by triallate herbicide, comprising crop seed coated with a safening effective amount of a compound of the formula



or an agriculturally acceptable salt thereof, wherein R is



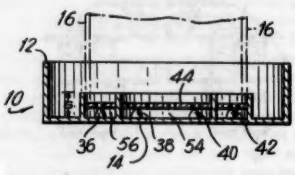
R_1 is hydrogen, methyl, ethyl or isopropyl; X and Y independently equal hydrogen, lower alkyl, lower alkoxy or halogen; R_2 is hydrogen or methyl; R_3 is hydrogen or chloro; n is 0, 1 or 2; provided that R_1 cannot equal ethyl when R_2 is hydrogen and R_3 is chloro.

4,317,311

ADJUSTABLE PLANT RECEPTACLE

Nancy Schmitt, 8 Red Deer La., Huntington, N.Y. 11743

Filed Jan. 7, 1980, Ser. No. 109,890
Int. Cl.³ A01G *9/02*
U.S. Cl. 47—66 **2 Claims**



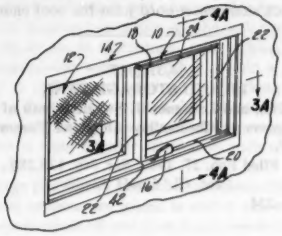
1. A plant receptacle comprising base means for supporting a plant and constituting a receptacle for soil and water, and containment means supported on said base means with selectively different cross-sections to accommodate different amounts of soil and thereby the growth of said plant, said containment means including at least first and second openable cylindrical means of different diameter selectively mountable on said base means, guide means on said base means to accommodate the different cross-sections of said containment means and hold the latter in position, said guide means being upstanding concentric ribs, said ribs being provided with openings to permit the passage of water, said guide means defining a central area and an annular area encircling said central area, flat perforate means in the central and annular areas above the base means to permit the drainage of water and to support the soil, and means to support the perforate means above the base means.

4,317,312

WINDOW CONSTRUCTION

Robert J. Heideman, Westland, Mich., assignor to Four Seazons Window Corporation, Ferndale, Mich.

Filed Jun. 16, 1980, Ser. No. 159,522
Int. Cl.³ E05D *15/10*
U.S. Cl. 49—220 **8 Claims**



1. An improved window construction including:
a generally rectangular window frame;
a generally rectangular framed vent sash movably mounted within said window frame;
latching means for securing said vent sash in various positions in said window frame;
said latching means includes means for moving said movable vent sash in in-and-out motion relative to said window frame;
said in position of said vent sash being with said vent sash frictionally engaging opposing surfaces of said window frame;
said out position of said vent sash enabling movement of said sash with respect to said window frame;
locking means comprising a pair of elements respectively carried by said window frame and said movable vent sash which move into alignment by movement of said vent sash to the closed position in said window frame and which are moved into interlocking registry upon in movement of said vent sash by operation of said latching means, whereby said vent sash is locked in said closed position;
one of said elements comprising a projection secured to one of said window frame and said vent sash and extending between said window frame and said vent sash, the other of said elements comprising a recess in the other of said window frame and said vent sash, said recess moving into alignment with said projection when said vent sash moves to the closed position thereof, said projection having a length less than the extent of said in-and-out movement of said vent sash upon operation of said latching means and greater than the space between said vent sash and said window frame after said latching means is operated, whereby said projection and recess move into and out of interlocking registry with the operation of said latching means to establish said interlocking relationship therebetween upon operation of said latching means with said vent sash in said closed position.

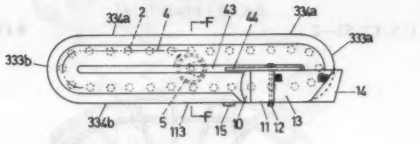
4,317,313

LONG-TRAVEL ANNULAR VIBRATORY BARREL FINISHING APPARATUS FOR LINE-PROCESSING

Hisamine Kobayashi, Nagoya, Japan, assignor to Kabushiki Kaisha Shikishima Chipton, Nagoya, Japan

Filed Apr. 4, 1980, Ser. No. 137,441
Claims priority, application Japan, Apr. 9, 1979, 54-42881; Mar. 5, 1980, 55-27800
Int. Cl.³ B24B *31/00*
U.S. Cl. 51—163.2 **6 Claims**

1. A long travel vibratory barrel finishing apparatus for line processing of workpieces to be finished, said vibratory finishing apparatus comprising:
an elongated vibratory barrel having two opposed semicircular barrel outer wall segments and straight barrel outer wall segments extending therebetween to form the elongated barrel, said barrel having a length from 5 to 15 times the width in the direction transverse to the straight barrel outer wall segments, and said barrel having a cross-section transverse to the length thereof which is symmetrical about the center of the cross-section and having two circular portions, said barrel further having a protrusion extending along the bottom of the interior thereof and extending upwardly into the interior of the barrel to a level below the top thereof;



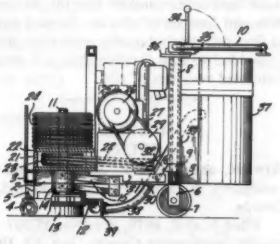
a plurality of springs supporting the bottom of said vibratory barrel and extending along the bottom of the barrel in a line generally parallel to the axis of the circular cross-sectional portions; and
a vibrator at the center of said barrel and having a vertical rotary shaft and having unbalancing weights on the upper and lower ends of said rotary shaft at a predetermined angle to each other around the axis of the shaft for producing a predetermined vibration force during rotation of said shaft.

4,317,314

SURFACE FINISHING MACHINE

Per Carlström, Karlskrona, and Gert Persson, Lyckeby, both of Sweden, assignors to Dynapac Maskin AB, Solna, Sweden

Filed May 13, 1980, Ser. No. 149,474
Claims priority, application Sweden, May 17, 1979, 7904336
Int. Cl.³ B24B *23/02*
U.S. Cl. 51—177 **13 Claims**



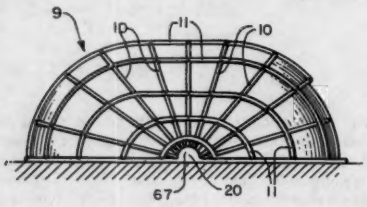
1. A machine for finishing a flat surface, for example a floor made of cement, concrete, or similar hardened material, comprising a chassis, means for supporting said chassis on said flat surface including at least three spaced wheels arranged to carry the weight of said chassis, a grinding tool, and means for mounting said tool to said chassis for rotation in a plane parallel to said flat surface about a vertical rotational axis and for resting said tool on said flat surface when grinding work is in progress, wherein the weight of said tool is carried by said surface and wherein the mounting means for said tool comprises a rotational shaft arranged in said vertical rotational axis, a grinding head arranged on said rotational shaft and attached to said tool, bearing means on said rotational shaft for permitting rotation of said rotational shaft and thereby said grinding head and tool about said vertical rotational axis, means for attaching said bearing means to said chassis for permitting vertical movement of said bearing means and thereby said

grinding head and tool relative to said chassis, and means for supporting weights on said tool for adjusting the downward pressure of said tool against said surface independent of said chassis, wherein two of said wheels are parallel and fixed about a vertical axis such that the weight of the chassis acting on said non-pivotable wheels counteracts the torque generated by the rotating tool.

4,317,315
INFLATABLE SHELTER

Dennis W. LeBlang, 25665 Eagle Dr., Mundelein, Ill. 60060

Filed Jul. 25, 1979, Ser. No. 60,572
Int. Cl.³ E04B *1/345*
U.S. Cl. 52—2 8 Claims

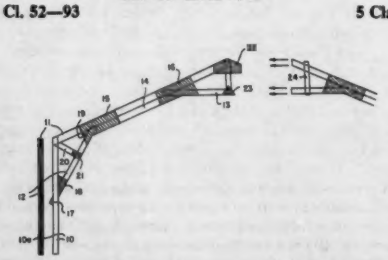


1. A shelter or part thereof of the type having as a unitary structure a flexible skin and a plurality of flexible inflatable tubes which when inflated act as supporting ribs for said flexible skin, comprising a flexible skin of impervious material having elongated portions sealed in a manner forming a first set of a plurality of tubular ribs so located as to leave the other portions of said flexible skin disposed so as to serve as the enclosing skin between said tubular ribs; and a second set of additional tubular ribs crossing said first set, said second set being formed of portions of said flexible skin and strips of flexible impervious material capable of being welded to said flexible skin and of a width such that when their marginal portions are welded to said flexible skin the unattached areas, respectively, between such welded margins are adequate to constitute the desired tubular ribs, said strips being applied directly to said flexible skin and on the side thereof opposite to that on which said first set of ribs are formed and across portions of said first set of tubular ribs with their marginal edges respectively welded to said flexible skin and means for introducing air into said two sets of ribs.

4,317,316
TRUSS

Eldon W. Atwood, and Alfred E. Johnson, both of Cardston, Canada, assignors to Dandi Products Limited, West Lethbridge, Canada

Filed May 1, 1979, Ser. No. 35,007
Claims priority, application Canada, Jun. 13, 1978, 305332
Int. Cl.³ E04B *7/02*
U.S. Cl. 52—93 5 Claims

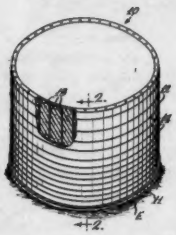


1. A truss for building construction comprising first and second wall columns, a first roof element connected to said first column and a second roof element connected to said second column, knee braces connecting each wall column intermediate its ends with the connected roof elements intermediate their ends, a center cord interconnecting said roof elements, said roof elements each being secured by means including an extra wooden element arranged vertically edge-to-edge with respect to said roof elements and bridging the point at which the knee braces join said roof elements and the point at which said center cord joins the roof elements.

4,317,317
LIQUID STORAGE TANK

Harold J. Kilts, and Laurence J. Swaziek, both of Middleton, Wis., assignors to Chromalloy American Corporation, New York, N.Y.

Filed Feb. 27, 1980, Ser. No. 125,280
Int. Cl.³ E04H *12/12*
U.S. Cl. 52—224 19 Claims



1. In a liquid storage tank of the type which has a base and an annular post-tensioned concrete sidewall seated on said base, the improvement comprising, in combination:

a multiplicity of tension rods anchored in the base, each of said tension rods extending upwardly out of direct contact with any part of the sidewall and having an upper end portion above the plane of the top of the sidewall adapted to receive a tension fitting;

and a tension fitting operatively engaged with the upper end portion of each tension rod and bearing effectively perpendicularly upon the top of the sidewall to post-tension the sidewall by pulling on the tension rod to force the sidewall strongly toward the base.

4,317,318
SUPPORTING GRID SYSTEM HAVING INTERCHANGEABLE T SECTIONS

Gale E. Sauer, Williamsville, N.Y., assignor to Roblin Industries, Inc., Buffalo, N.Y.

Filed Sep. 4, 1979, Ser. No. 71,869
Int. Cl.³ F16B *7/22*
U.S. Cl. 52—667 4 Claims

1. A supporting grid system for suspended ceilings and the like, said system being of the type having main tee members extending in spaced-apart parallel relation and cross tee members extending at right angles to said main tee members to define a standard 1X by 2X module, said members having web

portions upstanding from laterally projecting tile supporting flange portions, said system being characterized by:

(a) said main and cross tee members comprising interchangeable tee sections, whereby said sections form both said main tee members and said cross tee members and are usable as either;

(b) said interchangeable tee sections having locking connectors projecting from the web portion thereof beyond the flange portions thereof, said sections also having locking connector receiving slots through the web portion thereof at spaced locations therealong, said locking connectors being engageable with each other to join a pair of said sections in end to end relation, said locking connectors extending through one of said slots of a section used as a main tee member to join a pair of sectjons used as cross tee members in right angular relation to such main tee sections; and

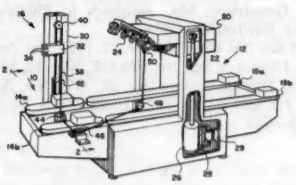
(c) the flange portions of said sections substantially abutting when said sections are joined in end to end relation, and the flange portions of said cross tee sections overlying the flange portions of said main tee section.

4,317,319

HEIGHT SENSING FOR BOX CLOSER

Douglas A. Price, 25 Bonacres Dr., West Hill, Ontario, Canada M1C 1P6

Filed May 2, 1980, Ser. No. 146,169
Int. Cl.³ B65B *57/00*
U.S. Cl. 53—76 **9 Claims**



1. In a random box closing apparatus of the type having a box closing and sealing station having a sealing head which is movable upwardly and downwardly by powered movement means to accommodate boxes of different heights and having a main conveyor means adjustable for box width, and further having a box sensing station for sensing the height of the box, and having sensing conveyor means adjustable for box width and for further sensing the width of the box, and thereby controlling the spacing of the main conveyor means in the box closing and sealing station, and wherein the apparatus is characterized by;

height sensing means operable to sense the combined height both of the box and the upper closure flaps extending thereabove when open, and delivering a combined height signal responsive thereto;

movable carriage means upon which said height sensing means is movable upwardly and downwardly, at said box sensing station;

signal communication means connecting between said height sensing means, and said powered movement means, whereby to move said box sealing head vertically responsive to said combined height signal, and,

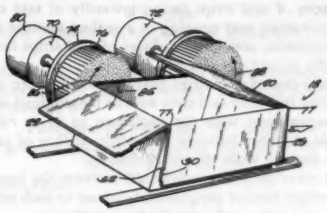
movement transmission means extending between said sealing head and a portion of said sensing conveyor means at said box sensing station and connecting with said height sensing means whereby to move said height sensing means vertically in response to a change in box width, and also moving said height sensing means vertically in response to vertical movement of said sealing head by said powered movement means.

4,317,320

IN-LINE CARTON SLITTING, FLAP FOLDING AND FLAP GLUING APPARATUS

Biagio J. Nigrelli, Kiel, Wis., assignor to Johns-Nigrelli-Johns, Inc., Sheboygan Falls, Wis.

Filed Sep. 17, 1979, Ser. No. 76,034
Int. Cl.³ B65B *7/20, 7/26*
U.S. Cl. 53—374 **14 Claims**



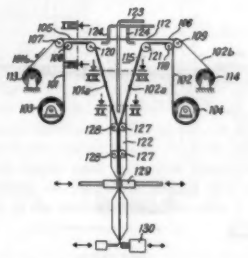
1. Apparatus for folding carton flaps comprising conveying means for conveying cartons with leading and trailing downturned flaps along a conveying path through a flap folding station, folding means including flap engaging elements, means for supporting and rotating said elements relative to said path and said cartons to engage said carton flaps, said means for rotating said elements providing rotation of said elements about an axis transverse to the direction of conveyor movement, which axis intersects the conveying path and the cartons carried on said conveying path so that said flap engaging elements engage the carton flaps during a portion of the upward arc of travel of the engaging elements to sweep the flaps upwardly and over the carton top.

4,317,321

PRODUCTION OF STERILE PACKAGES

Roland M. Torterotot, "Le Petit Chaillot", 78730 Rochefort-en-Yvelines, and Jean R. L. Nasica, 19, avenue Emile Deschanel, 75007 Paris, both of France

Division of Ser. No. 21,961, Dec. 5, 1979, Pat. No. 4,270,965, which is a division of Ser. No. 837,750, Sep. 29, 1977, Pat. No. 4,160,852. This application Mar. 3, 1980, Ser. No. 126,864
Claims priority, application France, Oct. 6, 1976, 76 30144; Jun. 1, 1977, 77 16772
Int. Cl.³ B65B *9/08*
U.S. Cl. 53—426 **13 Claims**



1. A process for producing a sterile package from a composite packaging laminate comprising at least two individual strips, one of which comprises a thermoplastic material, said strips being adhered together in a sealing manner at least at their edges whereby the adjacent surfaces of the strips lie in opposed, facing relationship, said adjacent surfaces being sterile and also being readily separable each from the other under the action of pulling forces applied to the individual strips in

divergent directions at a temperature which is at most equal to the softening temperature of the thermoplastic material, the thermoplastic material being such that after the separation of the two individual strips, the said one strip can be heat sealed to part of itself or to another individual strip with the application of heat and pressure to the thermoplastic material, said process comprising:

advancing said laminate lengthwise thereof to a sterile enclosure having an inlet opening;

separating said strips at said inlet opening with the sterile surfaces of said strips facing inwardly of said enclosure and covering said opening in a sealing manner and with the opposite, nonsterile surfaces of said strips facing outwardly of said enclosure;

removing one of said strips out of said enclosure while advancing the other said strip with its longitudinal side edges in engagement with the enclosure so as to maintain a sterile chamber between the sterile surface of said other strip and the walls of said enclosure;

as said other strip is so-advanced, moving the longitudinal side edges thereof progressively closer to each other so as to form a tube with a sterile inner surface;

sealing together the longitudinal side edges of the tube;

sealing together, at a first area, the inner surface of the tube transversely of the longitudinal direction of the tube to provide a tube section with an open end exposed to the sterile interior of the enclosure;

while said open end is exposed to a sterile atmosphere, filling the tube section with the desired amount of the material to be packaged by inserting said material into the section through said open end; and

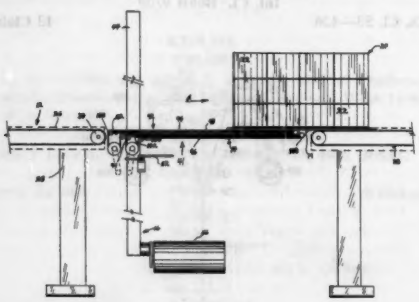
sealing together at a second area the inner surface of the tube transversely of the longitudinal direction of the tube at a point thereon which is spaced from said first area by a distance sufficient to contain said material to be packaged and which provides a sealed, sterile package containing said last-mentioned material.

4,317,322

ROTATABLE FILM WRAPPING APPARATUS WITH WRAP CARRYING MECHANISM

Patrick R. Lancaster, Anchorage, and William G. Lancaster, Louisville, both of Ky., assignors to Lantech, Inc., Louisville, Ky.

Filed May 20, 1980, Ser. No. 151,699
Int. Cl.³ B65B *13/04*
U.S. Cl. 53—399 **42 Claims**



28. A process of making a banded unitary package comprising the steps of:

(a) placing a plurality of loads each of which is comprised of a plurality of stacked members on a conveying device in a spaced apart relationship;

(b) transporting each load sequentially to a conveyor assembly positioned within a wrapping apparatus, said conveyor assembly comprising upper and lower conveyors, the upper of which supports the load and has the upper portion of its belt moving in a downstream direction, and the lower of which has the lower portion of its belt moving in said downstream direction at the same speed as the upper conveyor;

(c) stopping the conveyor assembly within a wrapping area of said wrapping apparatus;

(d) wrapping a band of material which has been substantially stretched from said wrapping apparatus around said load and conveyor assembly a plurality of times to engage said load and the lower belt portion of the lower conveyor to form a single band;

(e) severing said single band from said wrapping apparatus while holding the new leading edge of said band for subsequent wrap;

(f) activating said conveyor assembly to carry said load and said band wrapped around said conveyor assembly a predetermined distance along a linear path;

(g) stopping said conveyor assembly and wrapping a second band around said load and said conveyor assembly;

(h) severing said film web from said wrapping apparatus; and

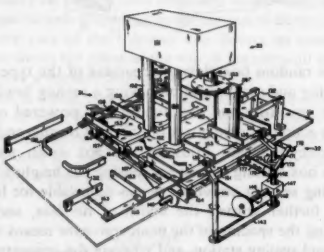
(i) activating said conveyor assembly to transport said load with a plurality of bands of stretched material wrapped thereon to a take-off conveyor, said take-off conveyor being spaced from said wrapping apparatus a sufficient distance to allow each wrapped band of material to regain its memory position around the load before it completely encounters the take-off conveyor.

4,317,323

APPARATUS FOR PRODUCING CONTAINERS

Frank P. Richards, Prairie Village, Kans., and Raymond C. Taylor, Grandview, Mo., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 853,651, Nov. 21, 1977, Pat. No. 4,204,462, which is a division of Ser. No. 630,555, Nov. 10, 1975, Pat. No. 4,072,226. This application Dec. 31, 1979, Ser. No. 108,318
Int. Cl.³ B31B *17/74;* **B65B** *43/46, 55/04*
U.S. Cl. 53—563 **14 Claims**



1. A machine for forming a tubular container from a generally rectangular flat sidewall blank having thermoplastic coatings on at least one of the upper and lower surfaces thereof and having first and second side margins and top and bottom margins, and from a generally flat closure blank, said machine comprising:

a turret having a plurality of forming mandrels positioned thereon with the elongated axis of each mandrel being in a plane perpendicular to the axis of rotation of said turret and extending radially with respect to said axis of rotation;

means for rotating said turret to position each said mandrel successively at a closure feeding station, a sidewall feeding station, a sidewall wrapping station, a bottom heating station, a bottom sealing station, and a container removal station;

closure supply magazine means for containing a plurality of said closure blanks;

closure transfer means for successively withdrawing an individual closure blank from said closure supply maga-

zine means and delivering the thus withdrawn blank to a closure forming means;

closure forming means located adjacent said closure feeding station for forming said closure blank into a closure having a desired configuration and depositing the thus-formed closure on the end of a mandrel located at said closure feeding station;

sidewall supply magazine means for containing a plurality of said sidewall blanks;

sidewall transfer means for successively withdrawing an individual sidewall blank from said sidewall supply magazine means;

first conveyor means for accepting each thus withdrawn sidewall blank and transporting it through a heating station to said sidewall feeding station;

means for intermittently actuating said first conveyor means;

heating means located at said heating station for heating the upper surface of said first side margin and for heating the lower surface of said second side margin of a sidewall blank located at said heating station;

means located at said sidewall wrapping station for wrapping a sidewall blank around a mandrel located at said sidewall wrapping station to overlap said first and second side margins of said sidewall blank and to position said bottom margin adjacent a portion of said closure;

means located at said bottom heating station for heating said bottom margin and the adjacent portion of said closure;

means located at said bottom sealing station for sealing said bottom margin to said adjacent portion of said closure to form a tubular container;

means located at said container removal station for removing said tubular container from said forming mandrel to container finishing apparatus comprising:

at least one receiving station for receiving tubular containers from said means for removing said tubular container from said forming mandrel;

conveyor means associated with each said receiving station for incrementally advancing each container received at said associated receiving station in a generally straight path along a container line to at least one subsequent container finishing station;

container finishing means located at at least one of said subsequent container finishing stations for performing a finishing operation on a container located at said one of said subsequent container finishing stations so as to provide a finished container;

gripping means operatively related to each said conveyor means for grasping a container at said one of said subsequent container finishing stations and substantially eliminating movement of said thus grasped container at said one of said subsequent container finishing stations, each said gripping means comprising:

two generally parallel gripping members located respectively at each side of said respective container line, each said gripping member being adapted to mate with the other said gripping member on the opposite side of said respective container line to define jaw means for grasping a container at said one of said subsequent container finishing stations and substantially eliminating movement of said thus grasped container at said one of said subsequent container finishing stations;

first means operatively related to each said gripping member located at a first side of each container line for moving each gripping member operatively related thereto between a first withdrawn position whereby containers can be moved by said conveyor means operatively related thereto along the generally straight path of the container line adjacent thereto and a second gripping position whereby said jaw means grasps a container; and

second means operatively related to each said gripping member located at a second side of each container line for moving each gripping member operatively related thereto between a first withdrawn position whereby containers can be moved by said conveyor means operatively related thereto along the generally straight path of the container line adjacent thereto and a second gripping position whereby said jaw means grasps a container; and

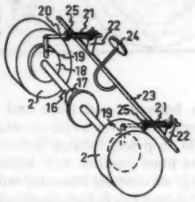
discharge station means associated with each of said conveyor means for receiving finished containers from said conveyor means and appropriately disposing of said containers thus received.

4,317,324

SYSTEM FOR MOTOR-DRIVEN RIDE-ON LAWN MOWERS

Gunnar Malmberg, Tranås; Roger Andersson, Gränna, and Kjell Pettersson, Tranås, all of Sweden, assignors to Stiga AB, Tranås, Sweden

Filed Jun. 27, 1980, Ser. No. 163,852
Claims priority, application Sweden, Jun. 29, 1979, 7905741
Int. Cl.³ A01D *69/10*
U.S. Cl. 56—11.3 **7 Claims**



1. A motor driven ride-on lawnmower which, when braked, resists overturning in a forward direction, comprising,

a frame,

a driver's seat,

a cutting assembly at the front of the mower,

a pair of rear wheels which are steerable with high turnability, steering controls connected to said rear wheels,

a forward wheel assembly on said frame which includes a front axle and front wheels, said front wheels being non-steerable,

a drive motor connected to the front wheels whereby said front wheels serve as the drive wheels for the mower,

said driver's seat and said drive motor being located behind a vertical plane through the front axle,

said cutting assembly having a major portion thereof located forwardly of said vertical plane through the front axle,

brake means operable on the front wheels,

a brake actuator member which is operable by the operator of the mower,

linkage means for transmitting forces from the brake actuator to the brake means,

said linkage means including resilient means which has spaced portions thereof operatively connected respectively to the brake actuator and the brake means, said resilient means having a resiliency which puts an upper limit on the force transmitted to the brake means by the linkage, said upper limit having a magnitude so as to prevent locking of the front wheels and any forward overturning of the mower caused thereby.

4,317,325

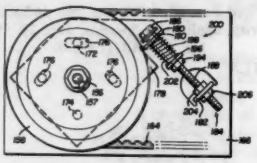
TIMING BELT ADJUSTMENT MECHANISM

John H. Marto, Oshkosh, Wis., assignor to J. I. Case Comany, Racine, Wis.

Filed Dec. 18, 1980, Ser. No. 217,730
Int. Cl.³ A01D *69/00, 55/26*
U.S. Cl. 56—11.6 **5 Claims**

1. A timing and tension adjustment mechanism for the timing belt of a lawn mower, said mower having at least two rotary cutting blades, said blades each rotatably mounted in a bearing

housing on a shaft comprising in combination a rotary blade assembly, said bearing housings mounted on a mower deck, said shafts extending through said deck is generally parallel relation, said shafts each having an annular sprocket mounted thereon and a flexible timing belt received around said sprockets rotating said blades in timed relation, said adjustment mechanism comprising: an adjustment plate overlying said deck mounting one rotary blade assembly on said deck, adjustment means adapted to rotate said adjustment plate and the mounted rotary blade assembly on a pivot axis to adjust the tension in said belt, said adjustment means including portions of said plate and said deck having generally coaxially aligned apertures, a threaded adjustment bolt having an enlarged head portion bearing against said adjustment plate portion and a threaded shank extending through said plate and deck portions, a stop



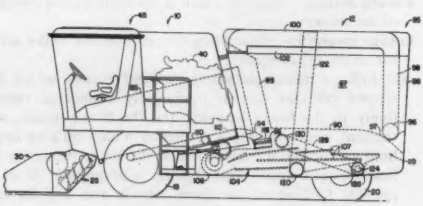
on said bolt shank between said plate and deck portions, a tubular spacer telescopically received on said adjustment bolt shank engaging said stop and located between said bolt stop and said adjustment plate portion, said adjustment plate portion aperture having an internal diameter sufficient to permit said tubular spacer to pass freely therethrough around said bolt shank, a compression coil spring telescopically received around said spacer having opposite ends engaging said adjustment plate portion and said stop and means adjusting said bolt longitudinally against said deck portion to adjust said bolt longitudinally against the force of said compression spring, said compression spring thereby rotating said adjustment plate about said pivot axis to adjust the tension in said timing belt and the space between said adjustment bolt head and said plate portion indicating the tension in said timing belt.

4,317,326

ARTICULATED COMBINE

Franz W. Riedinger, Einöd, Fed. Rep. of Germany, assignor to Deere & Company, Moline, Ill.

Filed Mar. 15, 1979, Ser. No. 20,863
Int. Cl.[3] A01F *12/18*
U.S. Cl. 56—14.6 **25 Claims**



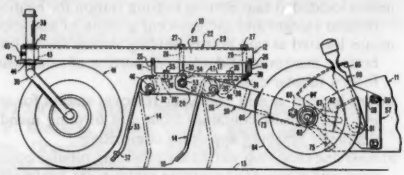
1. An articulated combine comprising: front and rear frame structures; pivot means pivotally connecting the front and rear frame structures for articulation about a generally vertical axis and including a lower pivot element having a vertical pivot axis and connecting the bottom portions of the front and rear frame structures and an upper pivot element interconnecting the upper portions of the frame structures; front and rear pairs of ground-engaging wheels respectively supporting the front and rear frame structures; means operative between the front and rear frame structures for swinging one frame structure relative to the other to effect steering of the combine; a forwardly disposed harvesting means supported on the front frame structure and operative to remove crop material from the field; a separating means supported on the front frame structure and operative to receive crop material from the harvesting means and separate grain included in said crop material; a grain tank mounted on the rear frame structure and including discharge means for emptying the grain tank; crop handling means mounted on said structures for delivering grain from the separating means to the grain tank; an operator's station mounted on the front frame structure; an engine mounted on one of said frame structures; and drive means operatively connecting the engine to at least one pair of said wheels to propel the combine and to the harvesting means, separating means, and crop handling means for driving said means.

4,317,327

PUSHED DETHATCHING UNIT

Charles W. Doering, New Albany, Ind., assignor to Brinly-Hardy Co., Inc., Louisville, Ky.

Filed Sep. 22, 1980, Ser. No. 189,030
Int. Cl.[3] A01D *76/00*
U.S. Cl. 56—396 **18 Claims**



1. A pushed dethatching unit including:
frame means;
wheel means supported adjacent the front end of said frame means to support said frame means;
said frame means having at least one row of tines mounted thereon, each of said tines in each of said rows being non-rotary;
each of said tines in each of said rows of said tines being offset in the direction of motion of said dethatching unit from each of said tines in each of said other rows of said tines when there is more than one of said rows of said tines;
each of said tines having a lower portion for engaging the material to be thatched;
and support means supported adjacent the rear end of said frame means to attach said frame means to pushing means to enable pushing of said dethatching unit by the pushing means, said support means and said wheel means cooperating to suspend the bottom tip of said lower portion of each of said tines above the ground so that no weight is applied to any of said tines when said dethatching unit is at rest, and each of said tines having the bottom tip of said lower portion beneath the point of attachment of said support means to the pushing means at all times.

4,317,328

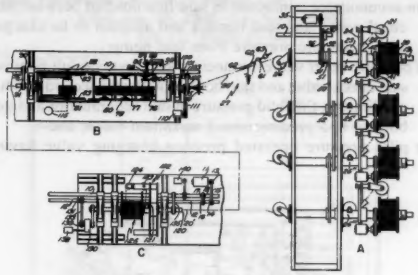
COMBINATION OF STRAND NEUTRALIZER CAPSTAN AND ACCUMULATOR AND CLOSER

Joseph R. Allard, Warwick, R.I., assignor to The Entwistle Company, Hudson, Mass.

Filed Jan. 5, 1981, Ser. No. 222,369
Int. Cl.[3] D07B *3/00, 3/02*
U.S. Cl. 57—59 **3 Claims**

1. A cabling apparatus for twisting together a plurality of strands comprising a pay-off neutralizer for each strand, each neutralizer having a hollow shaft, a reel axially mounted relative to said shaft, a flyer rotatably mounted about said reel,

each cable strand passing from said reel about the flyer and thence through said shaft to a twister, means rotating said flyer, said twister including an accumulator and capstan rotating in a frame, means rotating said frame, take-up means to package the cable, means rotating said take-up means, said means rotating said flyer, frame and said take-up means driving each of said elements in a one-to-one relationship.

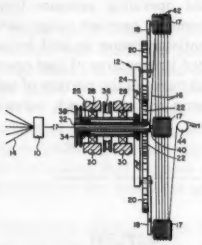


4,317,329

PLANETARY 'SZ' TWIST ACCUMULATORS

Jean M. Roberge, Montreal, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Sep. 18, 1980, Ser. No. 188,462
Int. Cl.³ H01B *13/04*
U.S. Cl. 57—294 **8 Claims**



1. An accumulator for a twisting or stranding apparatus for lengths of filamentary material comprising at least two accumulator rolls which are in radial alignment, radially spaced apart and rotatable about substantially parallel individual axes while both are rotatable together about a common accumulator axis which is substantially parallel to the individual axes with at least one of the rolls being movable around an accumulator capacity change axis spaced from and parallel to the individual axes, toward and away from the other roll to decrease and increase the capacity of the accumulator, and means to drive the rolls about the common axis to twist or strand said lengths and simultaneously to rotatably move the at least one roll towards and away from the other roll.

4,317,330

WATER TURBINE GENERATOR SYSTEM

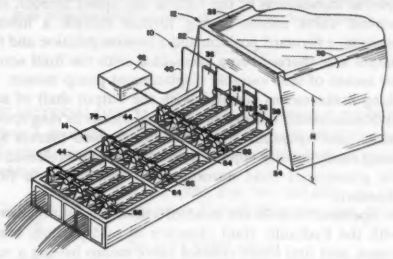
Mihaly Brankovics, 3423 S. Yorktown Ave., Tulsa, Okla. 74105

Filed Dec. 10, 1979, Ser. No. 101,420
Int. Cl.³ E02B *9/02*; F03B *3/00, 13/08*
U.S. Cl. 60—398 **6 Claims**

1. A water turbine generator system for use in streams and rivers comprising:

(a) a water holding basin positionable in a stream or river bed at one edge of the stream or river, said basin comprising an end wall of height H, a first side wall connected to the end wall and extending upstream along said stream edge, the upper surface of said first side wall maintaining a first constant elevation, a second side wall connected to the end wall and having a height of less than H adjacent said end wall and extending upstream and across stream, the upper surface of said second side wall maintaining a second constant elevation;

(b) a plurality of elongated water chutes longitudinally disposed in the stream bed downstream of the basin end wall, the upper ends thereof operably connected to the base of said end wall, each said chute being inclined with respect to the horizontal by an amount of 3° to 7°;



(c) at least one rotary turbine journalled in each chute, a generator operably connected to each said turbine, each said rotary turbine comprising an elongated shaft journalled in the chute parallel to said inclined chute and having a plurality of ribbon flight blades secured to the shaft in a helical pattern, the angle of said blades with respect to the longitudinal axis of said shaft being between 28° and 35°; and

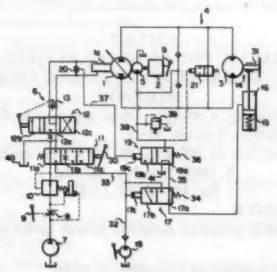
(d) a gate and movable closure member disposed between the base of the basin end wall and the upper end of each chute to provide selective flow of water from the basin through the chute for rotation of said turbine.

4,317,331

HYDRAULIC CIRCUIT FOR A HYDRAULICALLY DRIVEN VEHICLE

Taketo Aruga, and Koichi Morita, both of Isehara, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Nov. 28, 1979, Ser. No. 98,050
Claims priority, application Japan, Nov. 28, 1978, 53-162678[U]
Int. Cl.³ F16H *39/04, 39/46*
U.S. Cl. 60—436 **4 Claims**



1. A hydraulic circuit for a hydraulically driven vehicle, comprising in combination:

an engine;

variable displacement pump means driven by said engine having a fluid actuator means:

hydraulic motor means connected with said variable displacement pump means in a closed circuit and driven thereby, said hydraulic motor means having an output shaft connected thereto;

first fixed displacement pump means driven by said engine;

inching brake valve means connected with said first fixed displacement pump means, said inching valve means having at least a communicating position and a brake position and being normally held in the communicating position;

control valve means connected with the output side of said inching brake valve means for controlling the forward and reverse movements of the vehicle and speed thereof, said control valve means having formed therein a neutral position, a forward position and a reverse position and the output side thereof being connected with the fluid actuator means of said variable displacement pump means;

parking brake means coupled with the output shaft of said hydraulic motor means, said parking means having spring means and hydraulic fluid chamber formed therein and being mechanically applied by said spring and released by the pressurized fluid introduced in the hydraulic fluid chamber;

pilot operated first brake control valve means connected with the hydraulic fluid chamber of said parking brake means, said first brake control valve means having a normal first position and a second position;

manually operated pump means connected with said first brake control valve means, the pilot operator thereof and with said inching brake valve means, said manually operated pump means introducing pressurized fluid into the hydraulic fluid chamber of said parking brake means through the second position of the first brake valve control means to release the parking brake means;

pilot operated second brake control valve means connected in series with said first brake control valve means to said parking brake means, a pilot port thereof being connected with the output side of said control valve means, said second brake control valve means having a closed first position and a communicating second position; and

second fixed displacement pump means driven by said engine and connected with said second brake control valve means whereby, while the engine is running and said control valve means is either in its forward position or reverse position, said parking brake means is automatically released by introducing pressurized fluid from said second fixed displacement pump means into the hydraulic fluid chamber of said parking brake means through the communicating second position of said second brake control valve means and the normal first position of said first brake control valve means and when said control valve means is shifted to the neutral position thereof said parking brake means is automatically applied.

4,317,332

HYDRAULIC POWER BRAKE SYSTEM AND HYDRAULIC BRAKE BOOSTER AND CONTROLS THEREFOR

Malvin L. Schubert, Kettering, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 16,208, Feb. 28, 1979. This application May 8, 1980, Ser. No. 147,966

Int. Cl.³ B60T *13/00*

U.S. Cl. 60—547 R **1 Claim**

1. A hydraulic pressure actuated power brake system comprising:

a pump for generating hydraulic pressure;

a hydraulic pressure suspended closed center power brake booster;

a hydraulic fluid reservoir for said pump;

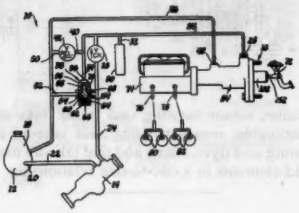
a first conduit connecting the output side of said pump to the input side of said booster and having a check valve therein permitting fluid flow therethrough only in the direction from said pump toward said booster;

a second conduit connecting the output side of said booster with said reservoir;

an accumulator connected in said first conduit between said check valve and said booster and adapted to be charged with hydraulic pressure from said pump;

a pressure relief valve connecting said first conduit between said check valve and said booster with said second conduit and limiting the fluid pressure in said accumulator and said booster to a predetermined maximum value; and

a pilot pressure operated pressure charging valve having



fluid communication with said first conduit on each side of said check valve and also being in fluid communication with said second conduit, said pilot valve and said relief valve cooperating to maintain and provide an operating pressure generated by said pump in the portion of said first conduit from said check valve into said booster and in said accumulator, said operating pressure being maintained within a predetermined pressure range suitable for establishing a differential pressure in said booster when said booster is actuated irrespective of said operating pressure generated by said pump in the portion of said first conduit between said pump and said check valve at the time of brake actuation.

4,317,333

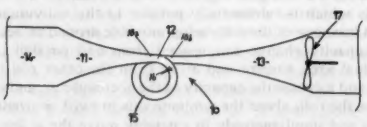
REMOTE WATER COOLED HEAT ENGINE

Charles W. Webby, 218 Crawford Rd., Gisborne, New Zealand

Filed Jul. 25, 1978, Ser. No. 927,759

Int. Cl.³ F01K *25/06*

U.S. Cl. 60—649 **16 Claims**



1. In a method of operating a heat engine including the steps of compressing, heating, expanding and cooling a gas, the improvement comprising:

(a) introducing a previously heated gas into a convergent portion of a fluid flow passage of said heat engine to effect expansion of the gas;

(b) cooling the previously heated gas by injecting a fluid into the fluid flow passage after it has been expanded by the convergent portion;

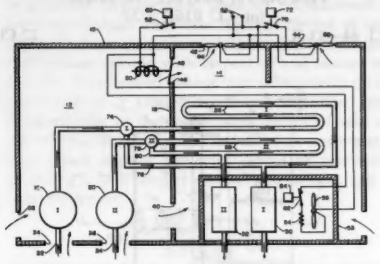
(c) compressing the now cooled mixture of gas and injected fluid by passing said mixture through a divergent portion of said fluid flow passage; and

(d) conducting said mixture to a working area.

4,317,334
REMOTE REFRIGERATION SYSTEM WITH CONTROLLED AIR FLOW

Emerson F. Burgess, Villa Park, Calif., assignor to Silva Restaurant Equipment Co., Inc., Cerritos, Calif.

Filed Jun. 16, 1980, Ser. No. 159,995
Int. Cl.³ F25B *39/04*
U.S. Cl. 62—183 **3 Claims**



3. Refrigeration system comprising a housing divided into a compressor compartment and a condenser compartment:

compressor means in said compressor compartment, condenser and receiver means in said condenser compartment, conduit means for flowing refrigerant from said compressor means through said condenser means to said receiver means;

air inlet means for admitting ambient air into said compressor compartment;

air outlet means for evacuating air from said condenser compartment;

first passage means for flowing air from said compressor compartment into said condenser compartment past said condenser, and thence through said outlet means;

second passage means for flowing air from said compressor compartment to said outlet means, bypassing said condenser, said second passage means including valve means for blocking or inhibiting air flow therethrough;

heating means for heating said receiver means;

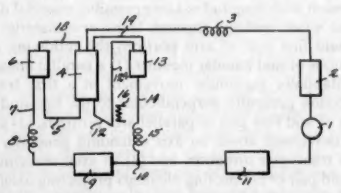
ambient temperature sensor means for sensing ambient temperature;

temperature-responsive control means for controlling said valve means and said heating means in accordance with ambient air temperature as sensed by said ambient temperature sensor means.

4,317,335
REFRIGERATING APPARATUS

Noboru Nakagawa, Osaka; Toshiyuki Oonishi, Takatsuki; Masato Tsutsumi, Osaka, and Akira Kawamoto, Takatsuki, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed May 27, 1980, Ser. No. 152,983
Claims priority, application Japan, Aug. 8, 1979, 54-101091
Int. Cl.³ F25B *9/00*
U.S. Cl. 62—199 **5 Claims**



1. Refrigerating apparatus comprising:

a compressor for compressing a refrigerant,

at least two evaporators which are controlled to a different temperature by evaporation of said refrigerant,

a tank for storing said refrigerant,

a plurality of conduits for conducting said refrigerant to said compressor, said evaporators and said tank,

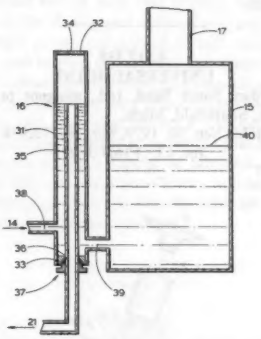
a rising portion which is formed by one of said conduits connecting said tank to one of said evaporators and of which the inner surface is irregularly formed, and

a heater winding around the outer surface of the irregularly formed portion and around the portion above said irregularly formed portion of said rising portion, thereby causing a smooth vapor bubble pumping action and supplying said refrigerant to a part of said one evaporator.

4,317,336
ELECTRON DISCHARGE TUBE COOLING SYSTEM

Arthur J. Bennett, and Peter R. T. Roberts, both of Cambridge, England, assignors to Pye (Electronic Products) Ltd., Cambridge, England

Filed Jun. 19, 1980, Ser. No. 161,086
Claims priority, application United Kingdom, Jul. 27, 1979, 26212/79
Int. Cl.³ F25B *19/00*
U.S. Cl. 62—514 R **3 Claims**



1. An electron discharge tube cooling system of the type in which part of the tube to be cooled is immersed in a coolant contained in a boiler, said system comprising:

a. a reservoir for the coolant;

b. means for supplying coolant from the reservoir to a submerged inlet for the boiler;

c. a condenser, connected to the boiler, for condensing coolant vapor generated in the boiler;

d. means for returning the condensate produced by the condenser to the reservoir;

wherein said means for supplying coolant to the boiler includes an overflow system for adjustably determining the level of the coolant in the boiler, said overflow system comprising:

e. an inlet connected to the reservoir for receiving coolant therefrom;

f. an outlet connected to the boiler inlet for supplying coolant thereto;

g. means for adjustably establishing a coolant overflow level in the overflow system;

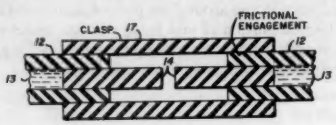
h. means for returning surplus coolant from the overflow system to the reservoir;

said coolant overflow level determining the pressure at which coolant enters the boiler inlet, which in turn determines the coolant level in the boiler for a predetermined vapor pressure in the boiler.

4,317,337
CLASP FOR GLOWING LIQUID FILLED TUBULAR JEWELRY

Judith Walden, 2577 ½ Beachwood Dr., Hollywood, Calif. 90068, and Dominic Sicilia, 569 N. Rossmore, Los Angeles, Calif. 90004

Filed Jan. 3, 1977, Ser. No. 756,577
Int. Cl.³ A44C 5/00
U.S. Cl. 63—3 2 Claims

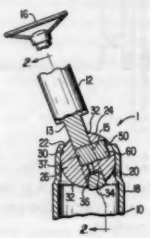


1. An article of chemiluminescent liquid filled tubular jewelry, said article having tubular end portions, chemiluminescent liquid filling the hollow portions of said tubular article of jewelry, means for sealing said liquid therein by sealing off said end portions of said tubular article, and a clasp comprising a flexible plastic member with an opening at each end, said openings being of a size and shape for snugly receiving therewithin said sealed off end portions of said tubular member and for maintaining them in clasped relation by frictional engagement therewith.

4,317,338
UNIVERSAL JOINT

David D. Jordan, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Sep. 10, 1979, Ser. No. 73,974
Int. Cl.³ F16D 3/02
U.S. Cl. 64—7 13 Claims



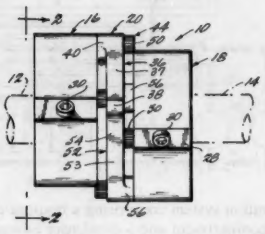
1. In a joint for connecting a pair of members, one of said members defining a cavity, the other of said members defining a receptacle having a cylindrical bore, a pair of sockets within said cavity, each socket including projections which are received within said receptacle to permit relative rotation between said pair of members in orthogonal planes, the improvement comprising one of said pair of sockets defining an opening, said projection on said one socket being substantially D-shaped wherein the curved portion of said D-shaped projection is circular and complementary with said cylindrical bore, said opening aligned and in communication with said receptacle at a predetermined relative position between said socket and said other member, said opening being substantially D-shaped; and

a pin having a substantially D-shaped cross-sectional configuration substantially identical to the cross-sectional configuration of said opening, extending through said opening and into said receptacle wherein at a predetermined relative position of said one socket and said other member, said D-shaped pin and said D-shaped projection are adjacent to each other to form a cylindrical boss of substantially the same diameter as said cylindrical bore.

4,317,339
FLEXIBLE TORQUE COUPLING FOR PARALLEL, ANGULAR AND/OR AXIAL MISALIGNMENT

Richard Schmidt, 11525 Islandale Dr., Cincinnati, Ohio 45240

Filed Mar. 5, 1980, Ser. No. 127,445
Int. Cl.³ F16D 3/52
U.S. Cl. 64—11 R 27 Claims



1. A coupling for resiliently transmitting torque from a first shaft to a second shaft while accommodating parallel, angular and/or axial misalignment between the axes of said first and second shafts, said coupling comprising:

a first annular member having means for fixedly securing the same to the first shaft for rotation therewith about an axis of rotation coincident with the axis of the first shaft,

a second annular member having means for fixedly securing the same to the second shaft for rotation therewith about an axis of rotation coincident with the axis of the second shaft,

a third intermediate member having an axis of rotation aligned with the axes of rotation of said first and second annular members when the axes of the latter are aligned,

said intermediate member including an annular portion disposed between said first and second annular members and first and second pairs of elongated generally parallel arm portions operatively associated with said first and second annular members respectively,

each of said arm portions being longitudinally extensible and contractible and including a fixed end fixedly interconnected with said annular portion within the axial extent thereof and a free end,

a first pair of connecting elements fixedly projecting axially from said first annular member and connected with the free ends of said first pair of parallel arm portions at positions related to the longitudinal extent of said first pair of parallel arm portions and the position of fixed connection of the fixed ends thereof with said annular portion so as to cause torque fixedly transmitted to said first annular member by the first shaft to be transmitted longitudinally through one of said first pair of arm portions to said annular portion under tension with longitudinal extensible material displacement and through the other of said first pair of arm portions to said annular portion under compression with longitudinal compressible material displacement while enabling through transverse material flexure of said first pair of arm portions the following relative motions of said annular member (1) a parallel linkage type substantially rectilinear movement in a first transverse direction generally perpendicular to the longitudinal extent of said first pair of parallel arm portions, (2) an angular movement about an axis extending generally in said first transverse direction, and (3) an axial movement, and

a second pair of connecting elements projecting axially from said first annular member and connected with the free ends of said second pair of parallel arm portions at positions related to the longitudinal extent of said second pair

of parallel arm portions and the position of fixed connection of the fixed ends thereof with said annular portion so as to cause torque transmitted to said annular portion to be transmitted longitudinally through one of said second pair of arm portions to said second annular member under tension with longitudinal extensible material displacement and through the other of said second pair of arm portions to said second annular member under compression with longitudinal compressible material displacement while enabling through transverse material flexure of said second pair of arm portions the following relative motions of said annular portion with respect to said second annular member: (1) a parallel linkage type substantially rectilinear movement in a second transverse direction generally perpendicular to the longitudinal extent of said second pair of parallel arm portions and said first transverse direction, (2) an angular movement about an axis extending generally in said second transverse direction, and (3) an axial movement.

4,317,340

LUBRICATING SEAL FOR UNIVERSAL JOINT

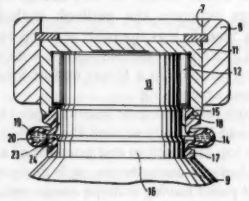
Werner Krude, Neunkirchen, and Karl-Heinz Müller, Wissen, both of Fed. Rep. of Germany, assignors to Uni-Cardan Aktiengesellschaft, Siegburg, Fed. Rep. of Germany

Filed Oct. 18, 1979, Ser. No. 86,249

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1978, 2848814

Int. Cl.³ F16D *3/30*

U.S. Cl. 64—17 A **2 Claims**



1. A universal joint assembly having a pair of yokes with yoke arms interconnected by a trunnion cross comprising: bores in said yoke arms for receiving said trunnion cross therein; bushing means received within said bores and interposed between said yoke arms and said trunnion cross; bearing means interposed between said bushing means and said trunnion cross; seal means having a generally annular configuration extending between said trunnion cross and said bushing means, said seal means having a first annular end fixedly connected to said bushing means and a second annular end fixedly connected to said trunnion cross; an annular resilient seal portion of said seal means extending between said first end and said second end thereof and shaped to define a generally annular lubricant reservoir having a supply of lubricant therein provided between said seal means and said trunnion cross at said resilient portion, said lubricant reservoir operating to provide a sealed supply of lubricant for said bearing means during operation of said universal joint assembly; duct means defined between the inner periphery of said first annular end and said trunnion cross maintaining a continuous lubricant flow path between said lubricant reservoir and said bearing means; and rib means formed on the inner side of said resilient seal portion adjacent said second end of said seal means, said rib means being adapted to be abutted by the inner side of said resilient seal portion adjacent said first end of said seal means in order to maintain a continuously open flow path between said lubricant reservoir and said duct means to said bearing means when said resilient seal portion is bent upon itself.

4,317,341

UNIVERSAL JOINT

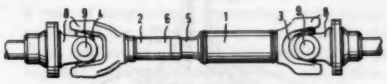
Werner Krude, Neunkirchen, Fed. Rep. of Germany, assignor to Uni-Cardan AG, Siegburg, Fed. Rep. of Germany

Filed Oct. 26, 1979, Ser. No. 88,823

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1978, 2848813

Int. Cl.³ F16D *3/26*

U.S. Cl. 64—17 A **5 Claims**



1. A universal joint comprising a pair of yokes each of which includes a pair of arms having bores therein, a trunnion cross including a main body and projecting portions extending radially outwardly from said main body, each said projecting portion extends at least partly through one of said bores and has an end face spaced outwardly from said main body, a bearing sleeve in each of said bores which is restrained from movement in the axial direction of said bore, a plurality of bearings arranged within each said bearing sleeve and disposed between said bearing sleeve and said projecting portion of said trunnion cross, and a flexible elastic seal extending across the radially outward end of each said bearing sleeve relative to said main body for closing said outward end and covering said end face of said projecting portion of said trunnion cross located within said bearing sleeve, each said elastic seal comprising an outer circumferential edge part secured to said bearing sleeve and a radically inner part extending at least partly across said end face, said inner part having a thickness significantly less than said circumferential edge part so that said inner part flexes outwardly when a supply of lubricant is introduced between said end face and seal, whereby said seal exerts pressure on the lubricant supply so that the lubricant is pressurized and is directed toward said bearings.

4,317,342

SLIDE FRAME FOR A WARP KNITTING MACHINE

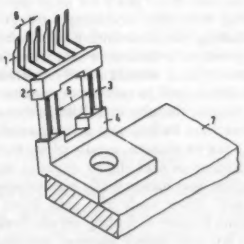
Karl Kohl, Obertshausen, Fed. Rep. of Germany, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed May 30, 1980, Ser. No. 154,933

Claims priority, application Switzerland, Jun. 26, 1979, 6072/79

Int. Cl.³ D04B *35/04, 23/00*

U.S. Cl. 66—120 **10 Claims**



1. A slide assembly for a warp knitting machine comprising an elongated slide bar,

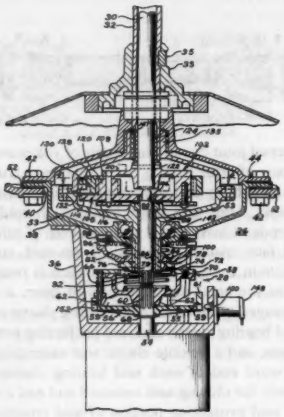
a slide frame for mounting a plurality of slides therein, and spacer means mounting said slide frame on said slide bar.

4,317,343

DRIVE ARRANGEMENT FOR A WASHING MACHINE

Otto F. Gerry, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Continuation-in-part of Ser. No. 87,900, Oct. 24, 1979, abandoned. This application Sep. 2, 1980, Ser. No. 183,607
Int. Cl.³ D06F 13/02
U.S. Cl. 68—23.7 10 Claims



1. A drive arrangement for a washing machine having an outer tub, a clothes receiving basket mounted within said tub and an agitator mounted within said basket, with a high speed rotation of the basket during a spin extraction cycle and relatively low rotational speed oscillation of said agitator to cause washing action of said clothing items disposed in said basket, the drive arrangement comprising:

drive motor means including a drive motor and a drive shaft driven by said drive motor means, said drive motor operable in first and second drive modes, wherein in said first mode, said drive shaft is rotated unidirectionally to effect said spin extraction cycle and in said second mode, said drive shaft rotation is cyclically reversed to cause oscillation of said agitator;

transmission means including a housing means rotatably connected to said basket being adapted to be driven in said first drive mode, and a reduction drive means including an input member arranged in said housing being connected to said agitator in said second drive mode to oscillate said agitator when said drive shaft is cyclically reversed;

means connecting said reduction gear means to said agitator; and,

selectively operable shifter means including a shifter element mounted on said drive shaft for axial movement thereon while being rotatably connected thereto, said shifter means including means mounting said shifter element so as in a first position to decouple said drive shaft from said input member; in a second axially shifted position coupling said drive shaft to said input member to said reduction gear means, thereby establishing direct drive to said washing machine basket; and a third axially shifted position of said shifter element axially offset from said first and second positions of said shifter element decoupling from said reduction gear means while maintaining said coupling between said drive shaft and said input member; said shifter means further including means braking said housing means by said shifter element moving to said third position, whereby in said third axial position of said shifter element, said drive shaft is adapted to drive through said input member and said reduction gear means to drive said agitator at a reduced rate of rotation in said second drive mode thereby producing agitator drive,

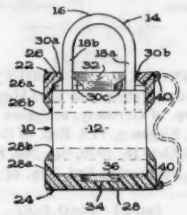
whereby oscillation of said agitator is achieved by driving said drive motor in said cyclically reversing mode and activation of said shifter means to produce said reduced drive through said reduction drive means to produce an oscillation of said agitator at a reduced rate of rotation and wherein with said drive motor in said unidirectional rotational mode and upon activation of said shifter means to drive said housing means, a relatively high speed unidirectional rotation of said washing machine basket is achieved.

4,317,344

PROTECTIVE TWO-PIECE COVER BOOTS FOR PADLOCKS

Robert L. Barnard, 8924 Cheltonham Pl., Annandale, Va. 22003

Filed Nov. 21, 1979, Ser. No. 96,586
Int. Cl.³ E05B 67/38
U.S. Cl. 70—55 13 Claims



1. Protective cover means for key-actuated, shackle type padlock casings wherein the padlock includes a bighted shackle having shackle legs operable at a top end, and having a key-operated locking mechanism housed within a casing, and an exposed key entrance in a lower end of a padlock casing, said cover means comprising

top and bottom resilient cover boots adapted respectively to pass over and fit snugly around the shackle legs and over respective top and bottom end portions of a padlock case;

the top and bottom cover boots each comprising a pliable planar end panel having a shape corresponding to that of the respective top and bottom ends of the padlock casing, and each panel having an integrally formed marginal flange projecting generally perpendicular from said panel for snugly embracing the related end portion of said padlock casing; and

said top cover boot's end panel having a pair of apertures of a size slightly smaller than the cross-sectional shape and area of the shackle legs, said apertures being spaced apart a distance corresponding to that between the shackle legs, and said end panel further having a self-closing slit interconnecting said spaced-apart apertures to facilitate application of the pliable boot over the shackle and onto the top end of said padlock casing.

4,317,345

FUEL TANK LOCKING DEVICE

Lee R. Hinson, Stockton, Calif., assignor to Fuel Lock Systems, Stockton, Calif.

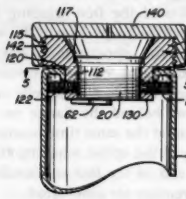
Continuation-in-part of Ser. No. 120,023, Feb. 11, 1980, abandoned. This application Jun. 23, 1980, Ser. No. 161,858
Int. Cl.³ B65D 55/14
U.S. Cl. 70—170 1 Claim

1. A locking device for a fuel tank of the type having a filler neck with its end having two slots opposite one another for receipt of a fuel tank cap with lips adapted for engagement with the slots on the filler neck end, the locking device comprising:

a sleeve having a central bore through its longitudinal axis, said sleeve further comprising a lower generally cylindrical portion having two threaded radially directed bores

extending therethrough from opposite sides of said sleeve and an upper generally cylindrical portion integrally connected with said lower portion and defining a rim extending radially outwardly beyond the radial extent of said lower portion for overlapping engagement with the end of the filler neck, the outer cylindrical surface of said upper portion being threaded;

two set screws threadable into said radial bores beyond the inner cylindrical surface of said sleeve for securing said sleeve to the filler neck after said sleeve has been inserted into the filler neck, each of said screws having a length such that they extend outwardly a substantial distance beyond the outer surface of the lower generally cylindrical portion of said sleeve and a diameter less than the width of the slots on the filler neck, whereby when said



sleeve is turned after it has been inserted into the filler neck, said screws compress the rim down onto the filler neck end;

a gasket for sealing the rim of the sleeve to the end of the filler neck;

a key-activated cylinder lock for blocking the central bore of said sleeve, said lock having a rotatable arm on its back face, whereby when said cylinder lock is inserted into the central bore in said sleeve, access to said set screws is prevented and said arm may be rotated to extend beyond the outer diameter of said lock and into engagement with said sleeve, thereby locking said cylinder lock within said sleeve; and

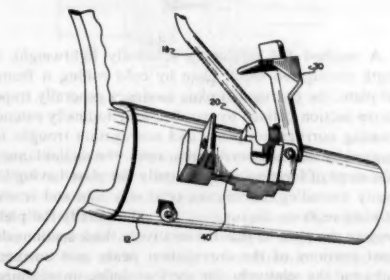
a replacement fuel tank cap adapted for threaded engagement with the upper portions of said sleeve for covering the filler neck.

4,317,346

VEHICLE IGNITION-TRANSMISSION PROTECTION ENCLOSURE

Edward J. Gutman, 1498 Middleton Rd., Cleveland Heights, Ohio 44121

Filed Dec. 10, 1979, Ser. No. 102,021
Int. Cl.[3] B60R *25/00*; E05B *17/14*; G05G *5/06*
U.S. Cl. 70—238 **5 Claims**



1. An enclosure device for the interlocking securement protection of the ignition keylock and the transmission gear shift lever on vehicle steering columns comprising:

(a) an adjustable transmission gear shift lever yoke having an upper member and a lower member, both said portions removably connected to each other and tightened into non-sliding relation around the shift lever adjacent the steering column, and including at least one brace tab on the yoke,

(b) an enclosure comprising:

(i) an elongated upper enclosure member including a longitudinal cover wall and a first padlock flange; and

(ii) an elongated lower enclosure member pivotally connected at one end to an end of the upper member having a pair of longitudinal intersecting walls designed to mate with the upper member cover wall to define a three wall enclosure when both members are pivoted together, and a second padlock flange arranged in parallel adjacent relation to the first padlock flange when the members are pivoted together, separate transverse walls within the intersecting longitudinal walls to define a transmission yoke compartment and an ignition keylock compartment whereby with the members together said adjustable yoke fits into the transmission yoke compartment securing the enclosure to the shift lever with the brace tab preventing movement of the enclosure members relative to the shift lever so the keylock compartment covers the ignition keylock, and

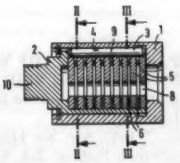
(c) means to hold the padlock flanges together.

4,317,347

CYLINDER LOCK

Kaarlo Martikainen, and Paavo Piiroinen, both of Joensuu, Finland, assignors to Oy Wartsila Ab, Helsinki, Finland

Filed Nov. 6, 1979, Ser. No. 91,737
Claims priority, application Finland, Sep. 11, 1978, 783412
Int. Cl.[3] E05B *15/14, 29/04*
U.S. Cl. 70—366 **8 Claims**



1. In a cylinder lock comprising a cylinder housing, therein a hollow turnable cylinder, enclosing a plurality of tumbler discs turnable by means of the key of the lock, and, between said cylinder housing and the peripheral edges of said tumbler discs, a locking bar locking said cylinder to said cylinder housing, said bar being movable from a position locking said cylinder, in which position said bar is located partly in a groove in the internal surface of said cylinder housing, to a position releasing said cylinder, by entering a channel formed jointly by lined-up notches in the peripheral edges of said tumbler discs, wherein the improvement comprises:

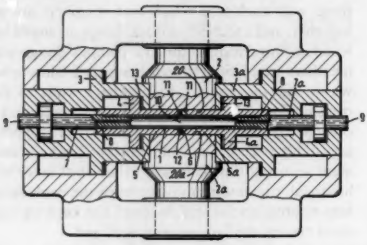
guiding discs arranged at least substantially non-rotatably with respect to said cylinder for laterally guiding the movement of said locking bar from said groove into said channel and cooperating with said tumbler discs, said locking bar and said turnable cylinder to provide a path for transmission of a turning force, thereby providing means for transmitting, in a completely released position of the lock mechanism, the lock operating turning force of the key of the lock from said key to a tumbler disc, therefrom to said locking bar and from said locking bar to said guiding discs and through them to said cylinder.

4,317,348

MAKING CONTOURED HOLLOWS

Clemens Halene, Düsseldorf; Josef Schlichting, Dinslaken, and Karl Strack, Herne, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Sep. 3, 1980, Ser. No. 183,720
Claims priority, application Fed. Rep. of Germany, Aug. 28, 1979, 2935086
Int. Cl.³ B21D *22/10*
U.S. Cl. 72—62 7 Claims



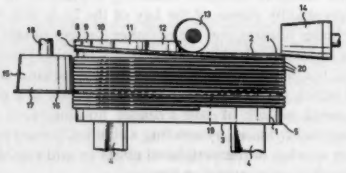
1. Machine for widening a tubular blank, comprising:
a first and a second complementary die having cavity portions defining the widening;
a pair of axially displaceable die elements, retractably positioned in the cavity portions, the die elements having particularly contoured front faces, facing each other in said die cavity, the tubular blank being inserted in the die elements inside said cavity; and
a pair of plungers extending into the interior of the die elements and the tubular blank, at least one of the plungers having a bore for passage of pressurized fluid so that the blank is widened towards the particularly contoured front faces and the die cavity, and the widened portions extend axially in abutment with the receding die elements.

4,317,349

METHOD AND APPARATUS FOR THE MANUFACTURE OF REINFORCEMENT SPIRALS

Kosti Reunanen, Lappi, Finland, assignor to Reunanen & Rovila Oy, Lappi, Finland

Filed Jan. 7, 1980, Ser. No. 110,101
Claims priority, application Finland, Jan. 9, 1979, 790046
Int. Cl.³ B21F *3/04*
U.S. Cl. 72—142 4 Claims



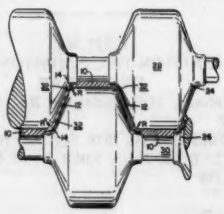
1. A method for the manufacture of a screw-line shaped reinforcement spiral of metal wire for the reinforcement of concrete pipes or columns, comprising the steps of winding the wire, as the wire is subject to tensile stress, onto a cylindrical last whose diameter is equal to the inner diameter of the spiral, passing the wire, before coming onto the last, over a roll for prestressing the wire to a curve of such a small diameter that, after the wire has been taken off the roll, a tension tending to bend the wire in the direction of bending of the reinforcement spiral remains in the wire, the prestressing occurring at the immediate proximity of an intial end of the last by passing the wire over the roll whose outer peripheral surface extends radially outwardly beyond an imaginary extension of the outer cylindrical surface of the last, thereafter passing the wire over a plurality of subsequent rolls whose outer peripheral surfaces are positioned inside said extension of the last to jointly provide a curvature to the wire whose curve radius is at a first subsequent roll larger than the radius of the last but becomes gradually smaller and, at a last subsequent roll, is the same as the radius of the last whereby any tensions attempting to change the diameter of the spiral in the radial direction are neutralized, guiding the wire wound onto the last by radial rolls placed at the initial end of the last and positioned with their axes lying radially in relation to the last, said radial rolls provide the winding with an opening tension effective in the axial direction of the spiral since the rise of the winding is at the beginning, of a portion of the first winding larger than the diameter of the wire, pressing a portion of the windings against the last with a flanged roll, penetrating a flange which is arranged at an end of the flanged roll facing towards the final end of the last between the windings and thereby causing a gliding of the windings placed behind the flange on the last by the width of the flange and at the same time bending the windings in the axial direction of the spiral whereby the tensions produced at said initial end of the last and tending to open the spirals in the axial direction are eliminated.

4,317,350

CORRUGATED PLATE HAVING VARIABLE MATERIAL THICKNESS AND METHOD FOR MAKING SAME

Eugene W. Sivachenko, 6471 Riverside Dr., Redding, Calif. 96001, and Firoze H. Broacha, Lakewood, Colo., assignors to E. W. Sivachenko, Redding, Calif.

Division of Ser. No. 962,365, Nov. 20, 1978, Pat. No. 4,241,146.
This application Aug. 8, 1980, Ser. No. 176,328
Int. Cl.³ B21B *1/08;* B21D *13/04*
U.S. Cl. 72—177 4 Claims



1. A method for producing relatively lightweight, high strength corrugated metal plate by cold rolling it from flat metal plate, the corrugated plate having a generally trapezoidal cross section defined by parallel, longitudinally extending, alternating corrugation peaks and corrugation troughs interconnected by inclined corrugation sides, the method comprising the steps of forming a substantially flat plate having longitudinally extending, alternating relatively thin and relatively thick plate sections; corrugating the substantially flat plate by deforming the plate so that the relatively thick sections define at least portions of the corrugation peaks and corrugation troughs and the relatively thin sections define interconnecting corrugation sides; and forming longitudinally extending, curved corrugation segments in the relatively thin plate sections between lateral edge portions of the corrugation peaks and corrugation troughs and corrugation sides adjoining such edge portions.

4,317,351

METHODS OF AND/OR APPARATUS FOR PUNCHING HOLES IN SHEET METAL

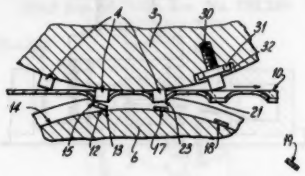
John G. Borrows, Auckland, New Zealand, assignor to Fisher & Paykel Limited, Auckland, New Zealand

Filed Mar. 11, 1980, Ser. No. 129,250

Claims priority, application New Zealand, Mar. 12, 1979, 189886

Int. Cl.³ B21D *28/26*

U.S. Cl. 72—186 12 Claims



1. A method for punching holes in a parent sheet metal employing a rotatable punching member including a series of punches and a backing roller including at least one groove between lands, said groove being aligned with said punches and having a base surface of predetermined depth relative to said lands, said method comprising the steps of advancing the sheet metal between the punching member and the lands of the backing roller so that each punch in the punching member causes a slug of metal to be cracked out of the parent metal until one edge of said slug engages the base surface of the groove of the backing roller at a fulcrum point about which the slug pivots to cause complete separation of the slug from the parent metal.

4,317,352

CUTTING DEVICES FOR EXTRUSION PRESSES

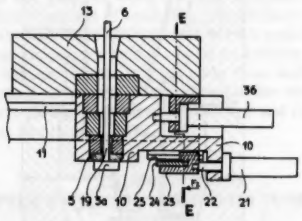
Michel Doudet, Epone, France, assignor to Secim, Courbevoie, France

Filed Jan. 10, 1980, Ser. No. 111,163

Claims priority, application France, Jan. 31, 1979, 79 02440

Int. Cl.³ B21C *35/04*

U.S. Cl. 72—255 5 Claims



1. A cutting device for a press for the direct extrusion of metal billets, the press comprising a longitudinally movable cylinder for receiving a billet, and a bed in which a transversely displaceable slide block is mounted, the slide block carrying a die, said cutting device being arranged to shear the residue remaining in the cylinder after extrusion of the useful part of a billet, to separate the residue from the extruded product, and comprising:

a plane blade which is displaceable in a direction perpendicular to the axis of extrusion between an inoperative position away from the die and from the product during extrusion and an operative position in which cutting takes place when the cylinder has been moved away from the die at the end of an extrusion operation;

guide means for guiding said blade in its displacement;

drive means for displacing said blade and for applying a cutting force to said blade; and

wherein said guide means and said drive means are mounted on the slide block, end parts of said guide means being disposed near the die to guide said blade perfectly during the cutting operation.

4,317,353

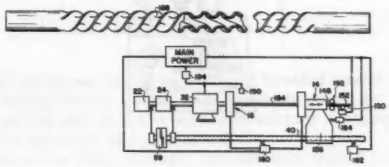
TUBE TWISTING APPARATUS

Elmo W. Geppelt, and William H. Poore, both of Tulsa, Okla., assignors to Delta t Limited, Tulsa, Okla.

Filed Dec. 26, 1979, Ser. No. 106,950

Int. Cl.³ B21D *11/14*

U.S. Cl. 72—299 8 Claims



1. An automated apparatus for twisting cylindrical tubes and comprising a support frame having a rotatable head collet and a reciprocal tail stock mounted thereon for supporting the tube therebetween, drive motor means, first drive means operably connected between the motor means and the head collet for actuation of the head collet, second drive means operably connected between the motor means and the tail stock for providing said reciprocal movement therefor, first cylinder means operably connected with said tail stock for alternately opening and closing thereof for receiving and clamping one end of the tube therein, second cylinder means operably connected with the head collet for opening and closing thereof for receiving and securing the opposite end of the tube therein, mandrel means for insertion through the tail stock and tube and head collet, means operably connected with said tail stock providing for limited forward reciprocal movement thereof prior to the initiation of the twisting operation, means operably connecting the tail stock to a lead screw for controlled reciprocal movement of the tail stock, sensing means responsive to the length of the progression of the twisting along the tube during a tube twisting operation for reversing the movement of the head collet and tail stock for a controlled unwinding and stretching of the twisted tube, sensor device means operably connected with the tail stock for actuation of both said tail stock cylinder and said head collet cylinder upon a preselected distance of reverse movement of the tail stock whereby the cylinders release the clamping engagement of the ends of the tube, means for a controlled insertion and withdrawal of said mandrel from the tail stock and tube and head collet, and final sensor device means for limiting the rearward movement of the tail stock for positioning thereof for the next succeeding tube twisting operation.

4,317,354

BLANK REJECTOR FOR FORGING MACHINE

Dale A. Wisebaker, Tiffin, Ohio, assignor to The National Machinery Company, Tiffin, Ohio

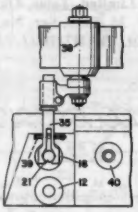
Filed Jan. 10, 1980, Ser. No. 110,948

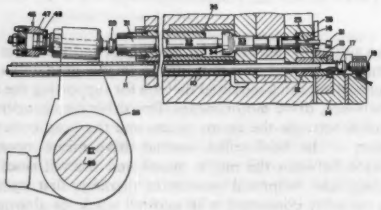
Int. Cl.³ B21D *45/00*

U.S. Cl. 72—339 13 Claims

1. A machine for sequentially forging workpieces comprising a plurality of work stations at which a workpiece is sequentially forged, a transfer for gripping and transferring work-

pieces between said work stations wherein said transfer includes gripping fingers for engaging said workpiece and holding said workpiece therein, a sensor associated with at least one work station operable to establish that an improper workpiece is at said associated work station, an ejector at said associated work station normally operable to eject a workpiece from said associated work station into said gripping fingers for transfer to a subsequent work station, said ejector including means for operating said ejector in response to a signal from said sensor to cause an improper workpiece to be ejected from said associated work station into momentary gripping engagement with said gripping fingers and out of gripping enagement with said gripping fingers.





2. A machine for sequentially forging workpieces comprising a plurality of work stations at which a workpiece is sequentially forged, a transfer for gripping and transferring workpieces between said work stations, a sensor associated with at least one work station operable to establish that an improper workpiece is at said associated work station, an ejector at said associated work station normally operable to eject a workpiece from said associated work station into said transfer for transfer to a subsequent work station, said ejector being operable in response to a signal from said sensor to cause an improper workpiece to be ejected from said associated work station without being allowed to be gripped by said transfer, means for operating said ejector through a first predetermined stroke and and means for operating said ejector through a greater stroke in response to said signal from said sensor.

4,317,355

FORGING OF A CAMSHAFT

Hiroshi Hatsuno, Higashi-Matsuyama, and Yoshimaro Okada, Yokyo, both of Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Mar. 14, 1980, Ser. No. 130,454

Claims priority, application Japan, Mar. 19, 1979, 54-32052

Int. Cl.³ B21D *37/16*; B21K *1/08*

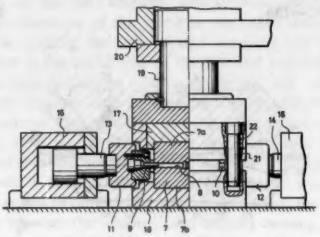
U.S. Cl. 72—342 **8 Claims**

1. A method of manufacturing by forging a camshaft having a plurality of plane cams, said plane cams being enlarged radially outwardly, and integrally formed on an outer peripheral surface of said camshaft in a longitudinal arrangement, the method comprising:

(a) heating an elongated blank of a metal or an alloy to a plurality of different temperatures, wherein the blank has a cam-forming portion thereof heated to said different temperatures in a manner gradually decreasing in heating temperature from an axially central position thereof towards opposite ends thereof;

(b) then positioning a substantially whole portion of the blank thus heated into a forging die; and

(c) axially applying pressure to said heated blank at opposite ends thereof in the forging die to cause the same to be



axially compressed, such that said cam-forming portion is radially outwardly deformed only by said axial pressure application and cams are formed on the cam-forming portion of the outer peripheral surface of the blank in sequence, starting first with the axially central position of the cam-forming portion towards the opposite ends thereof.

4,317,356

METHOD OF AND APPARATUS FOR FORGING A CONSTANT-VELOCITY BALL-TYPE UNIVERSAL JOINT

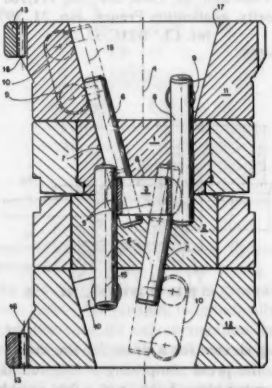
Karl-Wilhelm Stell, Stadtlohn, Fed. Rep. of Germany, assignor to Metallumform Hubert Eing, Gescher, Fed. Rep. of Germany

Filed Dec. 7, 1979, Ser. No. 101,141

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1978, 2853230

Int. Cl.³ B21D *22/00*

U.S. Cl. 72—355 **10 Claims**



1. A method of making a half of a constant-velocity ball-type universal joint, said method comprising the steps of:

substantially confining a workpiece blank in a cavity between a pair of relatively axially displaceable forging dies without substantial deformation of said blank;

thereafter nonaxially displacing a plurality of race-forming tools into said cavity and blocking said tools in place therein while maintaining said blank substantially confined in said cavity;

thereafter displacing said dies axially toward each other and thereby forging said blank against said tools and against said cavity to impart to said blank the shape of said cavity and of said tools;

thereafter nonaxially displacing said tools out of said cavity while maintaining said blank confined in said cavity; and

thereafter axially separating said dies and removing the forged blank from said cavity.

4,317,357

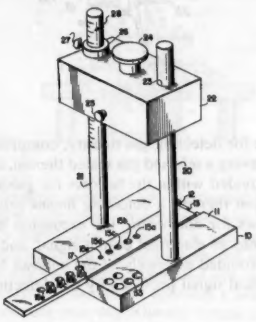
JET ORIFICE REDUCER

Jerry Moen, 4205 Flagstaff, Austin, Tex. 78758

Filed Jun. 10, 1980, Ser. No. 158,269

Int. Cl.³ B21J *7/06*

U.S. Cl. 72—438 **8 Claims**



1. An apparatus for reducing the size of a fuel flow orifice through a jet for a carburetor comprising

a base;

at least one guide shaft mounted on said base and extending upwardly therefrom;

a tool carrier having a predetermined mass;

said tool carrier being slidably mounted on said at least one shaft for movement toward and away from said base, and

said tool carrier having means for fixedly supporting a selected one of a plurality of tools pointing toward a target location on said base;

a plate having a plurality of openings for receiving a plurality of jets of different types;

means on said base for selectively and accurately locating said plate in any one of a plurality of positions corresponding to the number of jets such that, in each position, one of said jets is accurately held at said target location whereby, when said tool carrier is lifted away from said base and accelerated toward the base, said tool strikes the jet material surrounding the orifice therethrough and reduces the opening size thereof.

4,317,358

DIE LIFTER UNIT FOR PRESSING OR PUNCHING MACHINE

Keitaro Yonezawa, and Ichiro Kitaura, both of c/o Aioiseiki K.K. 14, Aza Hattanda, Hama, Amagasakishi, Hyogoken, Japan

Filed May 15, 1980, Ser. No. 150,144

Claims priority, application Japan, Jun. 5, 1979, 54-76671[U]

Int. Cl.³ B21J *13/02;* **B30B** *15/02*

U.S. Cl. 72—448 **10 Claims**

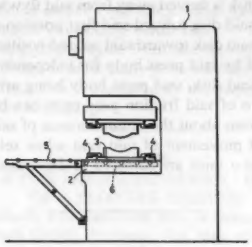
1. A die lifter unit for use in a pressing or punching machine having a bolster, said unit comprising:

an inverted substantially U-shaped rolled metal section having a central web;

said section having at least one slot in said central web in which a roller is rotatably carried with its peripheral surface partly protruding above the surface of said central web;

said section being disposed in a groove extending along the top surface of the bolster of said machine, wherein said section is supported in suspension by a heavy duty spring;

said spring resting on a spring seat transversely supported on opposite side walls of said section;



said spring seat having an internally threaded central boss through which a standard is threadably passed for supporting said section wherein said standard is upright on the bottom of said groove; and

said section being vertically movable with respect to said spring seat which is secured to said standard.

4,317,359

SCREW PRESS

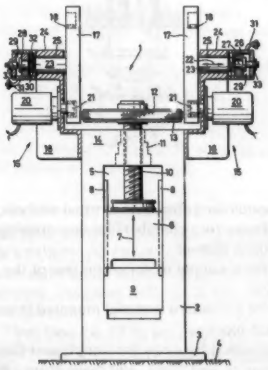
Otto Georg, Oststrasse 12,, 5805 Breckerfeld, Fed. Rep. of Germany

Filed Sep. 28, 1979, Ser. No. 80,799

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1978, 2843010; Apr. 20, 1979, 2917438

Int. Cl.³ B21J *9/18;* **B30B** *1/18*

U.S. Cl. 72—454 **18 Claims**



1. A screw press comprising a press body, a ram mounted for reciprocating movement relative to said body, a threaded spindle extending from said ram for transmitting movement to said ram, a nut member mounted in said press body for supporting said spindle for rotational movement about the axis of said spindle and for moving said spindle in the axial direction thereof when said spindle is rotated, a flywheel coaxially joined to said spindle for transmitting rotational movement to said spindle, and a plurality in excess of two friction gear units arranged about the circumference of said flywheel for rotatably driving said flywheel, each of said friction gear units

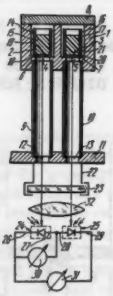
including a friction disk having its axis extending substantially perpendicular to the axis of said spindle so that said disk confronts the outer periphery of said flywheel, a shaft extending coaxially from said disk and supported by said press body for rotational and axial movement relative to said press body, wherein said disk is movable between a first position whereat said disk contacts the outer periphery of said flywheel to transmit rotational movement to said flywheel and a second position whereat said disk is moved away from said flywheel, means for moving each said disk toward said first position and means for moving each said disk toward said second position, and a drive unit supported by said press body for independently rotatably driving each said disk, said press body being arranged so that more than two of said friction gear units can be arranged at selected locations about the circumference of said flywheel to obtain desired movement of said ram when selected ones of said friction gear units are actuated to drive said flywheel.

4,317,360

APPARATUS FOR DIFFERENTIAL THERMAL ANALYSIS

Vladimir I. Vasilenko, prospekt Vernadskogo, 87, kv. 38; Jury A. Krakovetsky-Kocherzhinsky, prospekt Vernadskogo, 69 "A", kv. 39; Evgeny A. Shishkin, ulitsa Klovsky pusk, 18, kv. 82, and Jury A. Bojko, ulitsa Chkalova, 32, kv. 8, all of Kiev, U.S.S.R.

Filed Jun. 16, 1980, Ser. No. 159,849
Int. Cl.³ G01K *17/04*
U.S. Cl. 73—15 B **5 Claims**



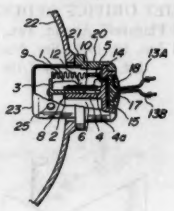
1. An apparatus for differential thermal analysis, comprising:
a block defining two chambers having openings in the bottom portions thereof;
a crucible for a sample mounted on one of the chambers of said block;
a crucible for a standard material mounted in another chamber of said block;
a baffle positioned between the sample and the corresponding opening in said block, and made from a material similar to that of said block;
a baffle positioned between the standard material and the corresponding opening in said block, and made from a material similar to that of said block;
a first photoelectric pyrometer pointed through the corresponding opening at said baffle positioned between the sample and said opening in said block;
a second photoelectric pyrometer pointed through the corresponding opening at said baffle positioned between the standard material and said opening in said block;
recording instruments electrically connected to the outputs of said photoelectric pyrometers.

4,317,361

GAS DENSITY DETECTING DEVICE FOR USE IN INTERNAL COMBUSTION ENGINE

Toru Kita, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Tokyo, Japan

Filed Feb. 27, 1980, Ser. No. 125,109
Claims priority, application Japan, Mar. 28, 1979, 54-36703
Int. Cl.³ G01N *9/26*
U.S. Cl. 73—30 **8 Claims**



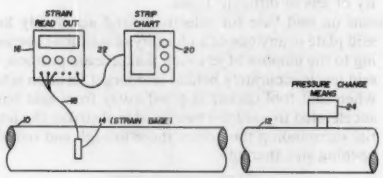
1. A device for detecting gas density, comprising:
a bellows having a selected gas sealed therein, a guide mechanism provided within the bellows for guiding an expansion motion thereof, a detecting means provided within the bellows for converting the expansion motion of the bellows into an electrical output signal, and a correcting resistor provided exteriorly of the bellows for correcting the electrical signal provided by the detecting means.

4,317,362

PIPELINE IDENTIFICATION

Leo J. Anderson, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jun. 30, 1980, Ser. No. 164,469
Int. Cl.³ G01M *19/00*
U.S. Cl. 73—37 **2 Claims**

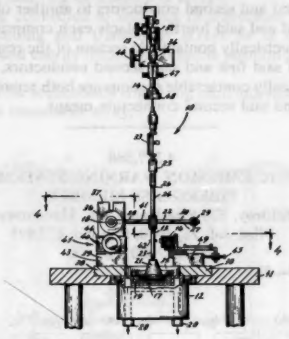


1. A method for verifying the identity of a pipeline at a site where its identity is uncertain as being the same pipeline at a location where the pipeline identity is certain, wherein tracing of the pipeline by visual observation is difficult from the location of certain identity to the site of uncertain identity, said method comprising:
a. affixing a strain gage to the pipeline at the site where its identity is uncertain;
b. varying the pressure within the pipeline at its location of certain identity by selected variations; and
c. observing the strain gage output at the location of uncertain pipeline identity to see if it produces variations in readings which correspond in time and magnitude to the variations of pressure applied to the pipeline at the location of certain identity.

4,317,363
ELASTOMER INSTRUMENT

Linus L. Shen, Libertyville, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Jun. 16, 1980, Ser. No. 160,060
Int. Cl.³ G01N *33/48*
U.S. Cl. 73—64.1 8 Claims



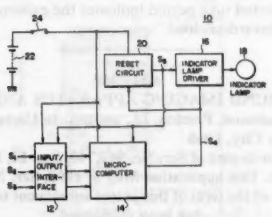
1. An elastometer instrument for measuring the mechanical strength of gels comprising a frame member including a sample cup holder, a sample cup positioned in said holder, a sample disk and transducer core assembly suspended above the frame member, the disk being positionable into and out of the sample cup, electromagnetic means for applying a magnetic force to the transducer core assembly whereby torque is applied to the disk to thereby apply a shear stress to the sample in the sample cup when the disk is positioned in the sample, and a tranducer assembly for measuring the displacement of the sample when subject to the shear stress,

said sample disk and transducer core assembly being suspended from a wire affixed to a micromanipulator adapted for precisely positioning the disk in the sample cup, and a precisely adjustable slide assembly adapted for positioning and control of the transducer assembly.

4,317,364
SELF-TESTING CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Masaharu Asano, Yokosuka, and Hidetoshi Kanegae, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Mar. 21, 1980, Ser. No. 132,422
Claims priority, application Japan, Mar. 23, 1979, 54-33879
Int. Cl.³ G01M *15/00*
U.S. Cl. 73—117.3 22 Claims



1. A method of self-testing a control system for an internal combustion engine of the type having a microcomputer with a memory, which comprises the following steps:

(a) detecting on/off states of starting signals of the internal combustion engine and supplying a signal indicative of the detected state to the microcomputer, the state indicating signal being stored in the memory;

(b) displaying the states of the starting signals on a display means by supplying an indication of the stored state indicating signal to the display means;

(c) writing a predetermined engine controlling value in the memory;

(d) detecting an actual engine controlling value;

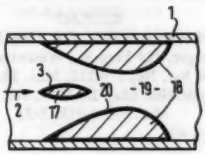
(e) in the microcomputer subsequently comparing the actually detected engine controlling value with the predetermined engine controlling value; and

(f) lastly supplying a signal from the microcomputer to the display means so an actually controlled state of the engine controlling value is displayed by the display means while the engine is rotating.

4,317,365
APPARATUS FOR THE MEASUREMENT OF THE MASS OF A FLOWING MEDIUM

Heinz Lauterbach, Esslingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 20, 1979, Ser. No. 96,129
Claims priority, application Fed. Rep. of Germany, Jan. 4, 1979, 2900220
Int. Cl.³ G01F *1/68*
U.S. Cl. 73—204 5 Claims



1. Apparatus for the measurement of the mass of a flowing medium such as for the measurement of induced air mass in internal combustion engines comprising

an intake manifold having a nozzle body disposed in at least a portion of the flowing medium thereof,

a carrier disposed upstream of a narrowest cross-section of said nozzle body,

a hot-film, temperature dependent resistor applied upon said carrier and in a path of said flowing medium defining a region of stabilized flowing medium, said resistor having at least one of the temperature and resistance characteristics of the flowing medium for developing thereby a measurement signal indicative thereof.

4,317,366
METHOD AND SYSTEM FOR MEASURING TEMPERATURES IN COMBUSTION CHAMBERS

Giesbert Tewes, and Henner Schmidt-Traub, both of Essen, Fed. Rep. of Germany, assignors to Krupp-Koppers GmbH, Essen, Fed. Rep. of Germany

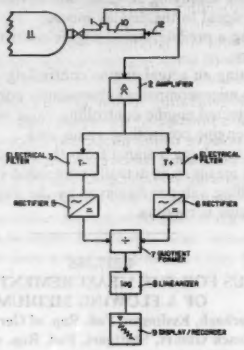
Filed Dec. 14, 1979, Ser. No. 103,534
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1978, 2854577
Int. Cl.³ G01K *3/08*
U.S. Cl. 73—339 A 6 Claims

1. A method of measuring the spatially averaged temperature in the interior of a combustion chamber, or other such gas-filled chamber, by reliance upon the temperature dependence of the acoustic properties of the interior of such chamber, comprising:

(a) imposing a pressure transducer into said chamber;

(b) sensing the spectrum of the acoustic response of the interior of said chamber to acoustic excitation produced by gas flow noise and flame noise in said chamber, with said transducer;

(c) developing, from at least one maximum of said spectrum, an indication of the frequency of at least one acoustic natural vibration of said interior of said chamber; and



(d) developing, from said indication of said frequency, an indication of the spatially averaged temperature within said interior of said chamber.

4,317,367

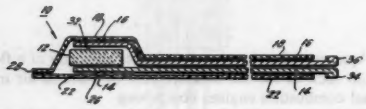
FEVER THERMOMETER, OR THE LIKE SENSOR

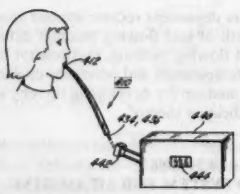
Milton Schonberger, 195 Fern St., Westwood, N.J. 07675

Continuation of Ser. No. 779,152, Mar. 18, 1977, abandoned. This application May 23, 1979, Ser. No. 41,551

Int. Cl.³ G01K 7/22

U.S. Cl. 73—362 AR **60 Claims**





1. A thermometer, comprising:

a thermistor which has the characteristic that it changes its electric properties as the temperature to which it is exposed varies; said thermistor having separated first and second electric contacts at which electric contact is established with said thermistor;

an elongated supporting substrate having elongated side surfaces; said substrate being comprised of flexible material and said substrate being dimensioned and having a cross-section such that said substrate is flexible; a first and a second conductor extending along said flexible substrate and being supported thereby on at least one said side surface of said substrate; said first conductor having a first contact section for connection to said thermistor first contact; said second conductor having a second contact section for connection to said thermistor second contact; said thermistor being supported on said substrate;

first connection means for effecting electrical connection between said thermistor first contact and said first conductor first contact section; second connection means for effecting electrical connection between said thermistor second contact and said second conductor second contact section;

respective third and fourth electric contacts connected with said first and second conductors and being located remote from said thermistor for enabling electric connection of said first and second conductors to another object;

said third and said fourth contacts each comprise a respective electrically contactable section of the respective said one of said first and said second conductors, which said electrically contactable sections are both remote from said first and said second connection means.

4,317,368

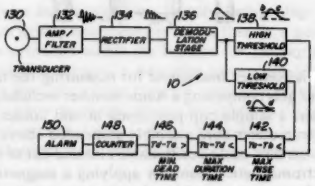
ACOUSTIC EMISSION WARNING SYSTEM FOR A FIBERGLASS MEMBER

John W. McElroy, 520 Strathmore Rd., Havertown, Pa. 19083

Filed Jul. 28, 1980, Ser. No. 172,875

Int. Cl.³ G01H 1/00

U.S. Cl. 73—587 **7 Claims**



1. An apparatus for use as an on-board monitor and warning system attached to a fiberglas member to detect potentially hazardous loads by detecting and counting acoustic emissions produced in the member by breakage of glass fibers and to produce a warning signal when the number of acoustic emissions detected in a selected period of time indicates the existence of a potentially hazardous load, comprising:

(a) a piezoelectric transducer to be placed in contact with a surface of the member to produce electrical signals corresponding to pressure waves detected in the member;

(b) means for distinguishing by the electrical signal those pressure waves which are acoustic emissions associated with the breakage of glass fibers from all other pressure waves;

(c) means for counting each electrical signal associated with fiber breakage;

(d) means for selecting a period of time during which the electrical signals associated with fiber breakage will be accumulated;

(e) means for producing a warning signal when the number of electrical signals associated with fiber breakage during the selected time period indicates the existence of a potentially hazardous load.

4,317,369

ULTRASOUND IMAGING APPARATUS AND METHOD

Steven A. Johnson, Preston, Id., assignor to University of Utah, Salt Lake City, Utah

Continuation-in-part of Ser. No. 942,740, Sep. 14, 1978, Pat. No. 4,222,274. This application May 8, 1980, Ser. No. 147,990

The portion of the term of this patent subsequent to Sep. 2, 1997, has been disclaimed.

Int. Cl.³ G01N 29/00

U.S. Cl. 73—607 **4 Claims**

1. An ultrasound imaging apparatus for reconstructing images of reflection from synthetically focused ultrasound energy, said apparatus comprising:

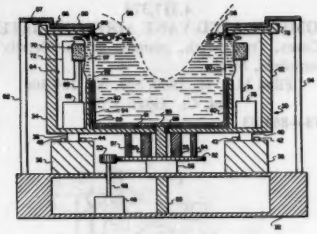
(1) a ring of transducer arrays adapted to circumscribe the object being scanned, said ring of transducer arrays com-

prising a plurality of transmitter arrays and receiver arrays, said transmitter arrays being located at different points around said ring of arrays;

(2) means, electronically connected to said transducer arrays, for sequentially triggering said transmitter arrays, thereby propagating semicircular wave fronts of ultrasound energy through said object at said different points around said ring of transducer arrays;

(3) means, connected to said ring of transducer arrays, for commutating said transmitter arrays so as to transmit ultrasound energy from each possible position around said object;

(4) means for sequentially triggering each individual element of each transducer array;



(5) means, electronically connected to said receiver array, for electronically storing said received ultrasound signals;

(6) means for developing a particular type of waveform for each said stored signal such that when said stored signals are combined so as to reconstruct therefrom an image of reflection, regions of both constructive and destructive interference will occur, said regions improving the point response of said combined signals so as to enhance the resolution of said reconstructed image of reflection;

(7) means, electronically connected to said storage means, for combining said stored signals so as to reconstruct therefrom said image of reflection corresponding to said scanned object; and

(8) means for displaying said reconstructed image of reflection.

4,317,370

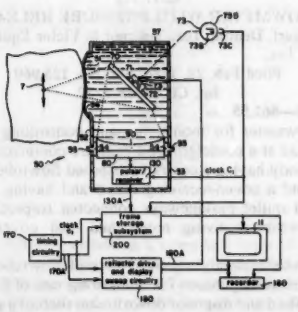
ULTRASOUND IMAGING SYSTEM

William E. Glenn, Ft. Lauderdale, Fla., assignor to New York Institute of Technology, Westbury, N.Y.

Continuation-in-part of Ser. No. 806,004, Jun. 13, 1977, abandoned. This application Dec. 12, 1979, Ser. No. 102,869

Int. Cl.³ G01N *29/00*

U.S. Cl. 73—620 **8 Claims**



1. Apparatus for scanning an object with a beam of ultrasound energy and for formulating an image from the ultrasound reflected from the object, comprising:

an ultrasound reflector disposed in the path of said ultrasound energy;

a fluid surrounding said reflector;

means for mechanically driving said reflector in an oscillatory fashion at a non-linear rate;

means for sensing the relative angular position of said reflector;

means for generating a first continuously variable clock signal as a function of the sensed position;

means responsive to the ultrasound reflected from said object for generating echo-representative electrical signals;

means for storing said electrical signals at a line rate which depends upon said first clock signal;

means for generating a second periodic clock signal;

means for reading out the stored signals at a line rate which depends upon said second clock signal; and

means for displaying the read out signals to obtain an image of the object, the line rate of said display being synchronized with said second clock signal.

4,317,371

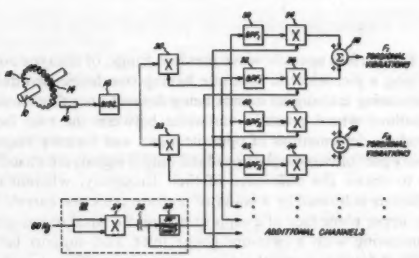
TORSIONAL VIBRATION MONITOR

John F. Wolfinger, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 30, 1980, Ser. No. 173,643

Int. Cl.³ G01H *1//10*

U.S. Cl. 73—650 **8 Claims**



7. A method for monitoring torsional vibrations in the rotating shaft of a turbine-generator set having an electrical output whose frequency is proportional to shaft speed, said method comprising the steps of:

(a) generating a signal representation of the instantaneous angular velocity of said shaft;

(b) demodulating the phase of said instantaneous angular velocity signal to produce a signal representation of torsional vibrations in said shaft;

(c) shifting the frequency of said torsional vibration signal from a measuring frequency range by an amount proportional to the frequency of said electrical output to obtain a lower frequency measuring signal;

(d) shifting the frequency of said torsional vibration signal from said measuring frequency range by an amount proportional to the frequency of said electrical output to obtain a lower frequency reference signal shifted in phase from said lower frequency measuring signal;

(e) filtering said lower frequency measuring signal with a plurality of parallel connected filters to produce a plurality of spectrally distributed lower frequency measuring signals;

(f) filtering said lower frequency reference signal with a plurality of parallel connected filters to produce a plurality of spectrally distributed lower frequency reference signals;

(g) shifting each spectrally distributed lower frequency measuring signal and each spectrally distributed lower

frequency reference signal back to said measuring frequency range; and

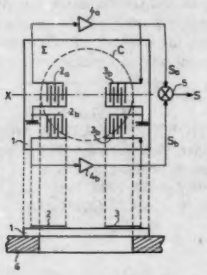
(h) correspondingly combining measuring signals and reference signals to obtain a set of signals representative of the spectral content of torsional vibrations of said shaft.

4,317,372

SURFACE ACOUSTIC WAVE PRESSURE GAUGE

Pierre Hartemann, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Mar. 6, 1980, Ser. No. 127,748
Claims priority, application France, Mar. 9, 1979, 79 06134
Int. Cl.³ G01L 11/00
U.S. Cl. 73—703 12 Claims



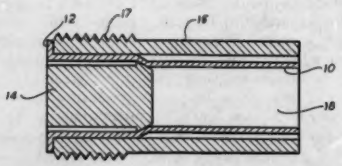
1. A surface acoustic wave pressure gauge, of the type comprising a piezoelectric substrate having two faces, two delay lines using interdigital combs being formed on a first face at positions where pressure variations between the two faces produce deformations of opposite signs, and forming respectively part of two oscillators whose output signals are mixed so as to obtain the difference of their frequency, wherein the substrate is formed by a wafer of uniform thickness carried by the upper plane face of a support having a central recess communicating with a pressure gauge inlet, said support being formed from a material whose expansion coefficient is such that it creates no thermal stress or strain within the wafer, said wafer capping said central recess and being glued to said upper face with a sealing joint.

4,317,373

FATIGUE CYCLE SENSOR AND METHOD

Michael J. Goes, 221 Randolph Ave., Mine Hill, Dover, Morris County, N.J. 07801, and John R. Masly, 534 Main St., Landing, Morris County, N.J. 07850

Filed Mar. 3, 1980, Ser. No. 126,803
Int. Cl.³ G01D 1/04
U.S. Cl. 73—787 4 Claims



1. A fatigue cycle sensor responsive to the magnitude and duration of force, comprising:

a body including a deformable tube having an aft portion possessing an inside diameter exceeding that of a forward portion thereof and having a flared end adjacent said aft portion,

a plunger mounted in said tube for relative motion therethrough in response to said force being applied behind said plunger, said plunger being shaped as a cylinder having a frusto-conical head possessing an outside diameter exceeding that of said cylinder of said plunger, thereby providing an interference fit in said tube resulting in deformation in response to relative motion between said plunger and said tube, and

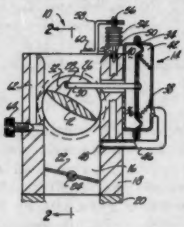
a sleeve encircling said deformable tube, said flared end being sized to abut and prevent slippage of said tube through said sleeve.

4,317,374

COMPENSATED VANE AIRFLOW METER

Gary L. Casey, Troy, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed May 15, 1980, Ser. No. 150,106
Int. Cl.³ G01F 1/38
U.S. Cl. 73—861.53 8 Claims



1. An improved airflow sensor of the vane type which indicates the airflow through an induction tube by the position of the vane, said sensor comprising:

a cylindrical air induction tube having an inlet end and an outlet end;

a rectangularly shaped airflow vane positioned between said inlet end and said throttling means, said vane mounted in a cylindrical mounting bore which is normal to said air induction bore and wherein the mounting bore is of a greater diameter than said induction bore, said vane rotatable in said mounting bore against a return force by the airflow through the induction bore such that the angle of rotation of the vane is a non-linearly proportional to the amount of airflow through the induction tube; and

an air motor for rotating said vane to maintain a substantially constant differential pressure across the vane.

4,317,375

FLOWMETER WITH PRESSURE RELEASE

Allen C. Egert, Denton, Tex., assignor to Victor Equipment Co., Denton, Tex.

Filed Feb. 29, 1980, Ser. No. 125,960
Int. Cl.³ G01F 1/22
U.S. Cl. 73—861.55 2 Claims

1. A flowmeter for monitoring and controlling flow of a gaseous fluid at a predetermined pressure comprising:

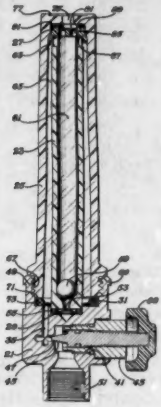
a. a main body having a centrally disposed flowtube-receiving recess and a cover-receiving recess and having respective inlet and outlet passageways connected respectively with said flowtube-receiving recess and said cover-receiving recess;

b. a flowtube sealingly received in said flowtube-receiving recess and having means for monitoring rate of flow of said gaseous fluid and disposed downstream thereof a passage for passing said gaseous fluid to said outlet passageway; said flowtube including a flow bob and having the central passageway of said flowtube varying in diameter longitudinally

thereof so as to provide a monotonically increasing differential area between said flowbob and interior walls of said flowtube; and indicia for calibrating and monitoring the flow of said gaseous fluid;

c. a cover disposed about said flowtube and sealingly received in said cover-receiving recess; said cover having a vent passage for venting said gaseous fluid if a pressure burst capsule is ruptured; said flowtube and said cover being transparent; and

d. a burst capsule sealingly connected interiorly of said cover



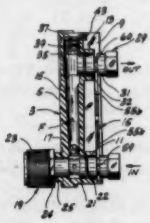
and intermediate said vent passage and said passage of said flowtube; said burst capsule having a diaphragm for rupturing when a predetermined pressure is exceeded and thereby preventing an explosion; said burst capsule having a a body containing said diaphragm, a female recess adapted to receive the top of said flowtube and a male end adapted to sealing engage the top of said cover; said top of said flowtube having laterally extending passageways for flow of said gaseous fluid past said burst capsule in normal flow; said vent passage being disposed in top of said cover above said burst capsule.

4,317,376

FLOWMETER WITH ONE-PIECE BODY

H. Paul Fitzpatrick, Newton Square, Pa., assignor to Emerson Electric Co., St. Louis, Mo.

Filed May 21, 1980, Ser. No. 151,926
Int. Cl.³ G01F *1/38*
U.S. Cl. 73—861.55 **10 Claims**



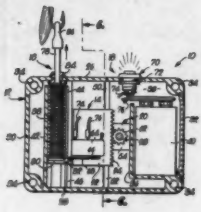
1. A flowmeter comprising a one-piece body of a suitable synthetic resin material, said flowmeter body having a flow path extending therethrough, said flow path including an inlet port, an outlet port, and a tapered flow passage between said inlet and outlet ports, the diameter of said tapered flow path increasing from the inlet to the outlet port thereof, an indicator movable within said tapered flow path in response to changes in the flowrate therethrough of a fluid whose flow rate is to be measured, a first fitting received in one of said ports, a second fitting received in the other of said ports, groove means in said flowmeter body, and a retainer received in said groove means slidable relative to said body between an unlocked position in which said valve means and said fittings may be installed in or removed from said inlet and outlet ports and a locked position in which said fittings are positively retained with respect to said flowmeter body in said inlet and said outlet ports.

4,317,377

DRAG ADJUSTMENT DEVICE FOR FISHING REELS

Donald R. Wrinkle, 9319 E. 84 Terr., Raytown, Mo.

Filed Sep. 26, 1980, Ser. No. 190,954
Int. Cl.³ G01L *5/10*
U.S. Cl. 73—862.42 **7 Claims**



1. A drag adjustment device for a fishing reel equipped with a line, comprising:

switch means;

switch operating means;

indicator means operatively coupled to said switch means for giving a perceptible indication when said switch means operates;

a drag element including structure for connection of said line thereto;

means mounting said drag element adjacent said switch means for shifting movement of the element under the influence of a pulling force through said line connected thereto;

means for biasing said element against said shifting movement thereof;

means for mounting one of said switch means and switch operating means on said drag element; and

means for selectively shifting the other of said switch means and switch operating means to a desired position spaced from the one of said switch means and switch operating means mounted on said element.

4,317,378

LIQUID SAMPLING APPARATUS

Jack L. Mustard, Borger, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 19, 1980, Ser. No. 161,109
Int. Cl.³ G01N *1/20*
U.S. Cl. 73—863.01 **12 Claims**

1. A liquid sampling device comprising:

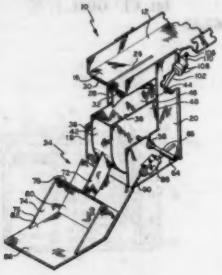
liquid conduit means having a liquid inlet end portion and a liquid discharge end portion for conducting liquid therethrough from the liquid inlet end portion toward the liquid discharge end portion;

liquid sample receptacle means disposed below the liquid discharge end portion of said liquid conduit means for receiving liquid samples through an open top portion of said liquid sample receptacle means into the interior of said liquid sample receptacle means;

support means operatively related to said liquid sample receptacle means for rotatably supporting said liquid sample receptacle means below the liquid discharge end portion of said liquid conduit means whereby said liquid

sample receptacle means is rotatable between a first position with the open top portion thereof open to one side, such that liquid drains from the interior through the open top portion of said liquid sample receptacle means, and a second position with the open portion thereof open upwardly such that liquid falling into the open top portion is collected in the interior of said liquid sample receptacle means;

first receptacle actuating means operatively related to said liquid sample receptacle means for rotating said liquid sample receptacle means from the first position thereof to the second position thereof in response to liquid falling from the liquid discharge end portion of said liquid con-



duit means at a predetermined rate and maintaining said liquid sample receptacle means in said second position for as long as liquid falls from the liquid discharge end portion of said liquid conduit means at a predetermined rate; and

second receptacle actuating means operatively related to said liquid sample receptacle means for rotating said liquid sample receptacle means from the second position thereof to the first position thereof in response to a reduction of the rate of liquid falling from the liquid discharge end portion of said liquid conduit means below a predetermined rate and maintaining said liquid sample receptacle means in said first position for as long as liquid falls from the liquid discharge end portion of said liquid conduit means at less than a predetermined rate.

4,317,379

PROCESS AND APPARATUS FOR THE CONTINUOUS WITHDRAWAL OF SPECIMENS FROM A CURRENT OF A CRUDE GAS FOR PURPOSES OF GAS ANALYSIS

Gerhard Oberländer, Leipzig; Reinhard Müller, Hoyerswerda, and Werner Funke, Markkleeberg, all of German Democratic Rep., assignors to Veb Gaskombinat Schwarze Pumpe, Schwarze Pumpe, German Democratic Rep.

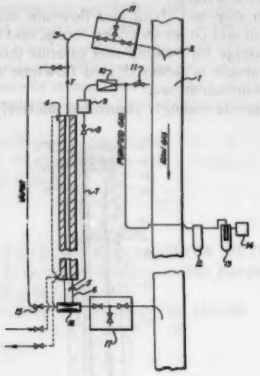
Filed Feb. 22, 1980, Ser. No. 123,794

Claims priority, application German Democratic Rep., Jan. 8, 1979, 210381

Int. Cl.³ G01N *1/24*

U.S. Cl. 73—863.12 **10 Claims**

1. A process for obtaining, in a continuous operation, a specimen gas from a current of a pressurized crude gas to permit subjecting the specimen to a gas analysis in order to control the main gas current, said process comprising passing the main crude gas through a passageway, withdrawing a branch crude gas current from the main gas in said passageway and passing the branch current through a cooling device, thereby forming condensate, separating said condensate, withdrawing the desired specimen from the branch current, the withdrawal of the branch current of the crude gas from the main current of crude gas and the withdrawal of the specimen from the branch current being effected in an anisokinetic manner, releasing the pressure of the specimen gas after withdrawal from the branch current, heating said condensate, reinroducing said condensate into said main gas current, said heating to keep solid and liquid gas contaminants fluid to



prevent obstructing said reintroducing, and passing the specimen to said gas analysis apparatus.

4,317,380

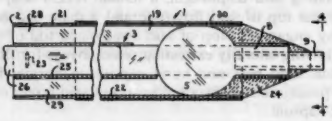
DEVICE FOR OBTAINING A SAMPLE OF MOLTEN MATERIAL AND METHODS OF ASSEMBLING COMPONENTS THEREOF

William J. Collins, 7005 Madison St., Merrillville, Ind. 46410

Filed Dec. 26, 1979, Ser. No. 107,157

Int. Cl.³ G01N *1/12*

U.S. Cl. 73—864.56 **32 Claims**



1. A holder for use with a pair of elongated mating sections which form a head provided with a chamber for receiving a molten material and a reduced tubular formation through which such a material may be caused to flow into the chamber, said holder comprising walls forming an elongated substantially tubular structure provided with opposed openings for receiving portions of such a head whereby to assist in holding such a pair of sections assembled lengthwise in said holder.

4,317,381

PUSHBUTTON TUNER

Tamaki Ohashi, Tokyo, Japan, assignor to Nihon Technical Kabushiki Kaisha, Japan

Filed Jun. 20, 1980, Ser. No. 161,435

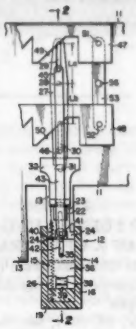
Claims priority, application Japan, Jun. 20, 1979, 54-76725

Int. Cl.³ H03J *5/12*

U.S. Cl. 74—10.33 **8 Claims**

1. A pushbutton tuner including a support, tuning means mounted on the support so as to be movable to a position which corresponds to a tuning frequency to be established, and a plurality of presettable pushbutton actuators for selectively adjusting the tuning means to individual positions, each of the pushbutton actuators including a pushbutton which is movable between a front inoperative and a rear operative position relative to the support and which is normally urged to its inoperative position, a control member pivotally mounted on the support and having lengthwise elongate slots formed in its

opposite ends, the control member assuming a position relative to the support which can be adjusted, a preset member for releasably locking the control member on the support, a first operating lever having its one end pivotally mounted on the pushbutton and carrying a pin on its other end which is fitted into one of the slots in the control member, and a second operating lever having its one end pivotally mounted on the pushbutton and carrying a pin on its other end which is fitted in the other slot formed in the control member, the tuning means including a pair of movable members extending in a direction perpendicular to the direction of movement of the



pushbutton, a link member having its opposite ends connected to the movable members so that a movement of one of the movable members in one direction causes a movement of the other movable member in the opposite direction, and means operative when the pushbutton is moved to its operative position to transmit a movement of the first or the second operating lever to one of the movable members to thereby cause that movable member to move in one direction, the movement of said one movable member in said one direction being terminated when the resulting movement of the other movable member in the opposite direction is constrained by the associated pin.

4,317,382

DRIVE MECHANISM FOR THE LEAF OR LEAVES OF A SLIDING DOOR OR THE LIKE

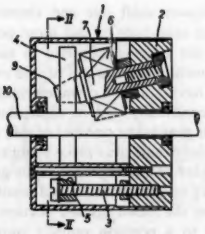
Rene Riser, Eiken, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Apr. 25, 1980, Ser. No. 143,603

Claims priority, application Switzerland, Apr. 30, 1979, 4056/79

Int. Cl.³ F16H *21/16*

U.S. Cl. 74—25 **4 Claims**



1. A device for translating rotary movement to lateral movement comprising:

a housing;

a shaft having a first axis of rotation rotatably mounted in said housing;

a bearing ring means for adjustably mounting said bearing ring in said housing coaxial with said shaft and movable longitudinally with respect to said first axis;

a plurality of rollers rotatably mounted in said housing such that said rollers contact said shaft, each of said rollers being mounted on a inclined bearing whose axis intersects said first axis of rotation, each inclined bearing having a first end secured to said housing and a second end contacting said bearing ring whereby said bearing ring is selectively positioned to effectively hold the rollers against the shaft with the desired force; and

drive means for rotating said shaft whereby said housing moves laterally along said shaft.

4,317,383

PROPORTIONAL LINEAR OUTPUT SYSTEM

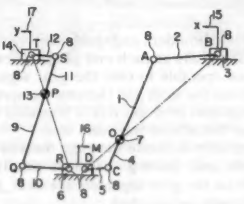
Toshiei Kurosaki, and Akihiro Takanashi, both of Kokubunji, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 27, 1980, Ser. No. 125,095

Claims priority, application Japan, Mar. 5, 1979, 54-24502

Int. Cl.³ F16H *21/44, 21/54*

U.S. Cl. 74—110 **11 Claims**



1. A proportional linear output system including a first lever pivotal about a first point, a second lever linked to the first lever at a second point and having an end point linked to an input element, and a third lever linked to the first lever at a third point and having an end point linked to an output element, wherein the first point and the second point of said first lever and the end point of said second lever, on the one hand, and the first point and the third point of said first lever and the end point of said third lever, on the other hand, define similar geometric figures, and wherein said input element and said output element are movable in planes parallel to each other.

4,317,384

MANUAL OVERRIDE DRIVE APPARATUS

Douglas G. Calvin, Missouri City, and Richard C. Babb, Houston, both of Tex., assignors to Tapco International, Inc., Houston, Tex.

Filed Jan. 28, 1980, Ser. No. 116,352

Int. Cl.³ F16H *1/18*

U.S. Cl. 74—424.8 A **13 Claims**

1. An engageable and disengageable gear asembly for driving a shaft axially comprising,

a body having an axial bore therethrough,

a shaft movable axially through the bore and having screw threads thereon,

a keyway extending axially along the shaft,

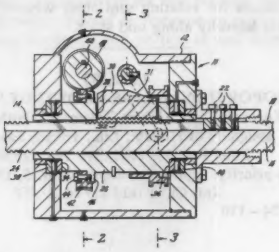
a key connected to the body and slidably disposed in the keyway preventing rotation of the shaft,

a cage in the body rotatably diposed about the shaft and having a plurality of circumferentially disposed elongate pockets therethrough and annularly-extending, inwardly facing thrust shoulders at each of the pockets and outwardly facing annular thrust shoulders at each end of the cage,

thrust bearings rotatably disposed in the body about the shaft having inwardly facing annular thrust shoulders disposed

on each side of the cage, the thrust bearings annular thrust shoulders bearing against their cooperating annular thrust shoulders on the cage and thereby restraining axial movement of the cage,

a plurality of gear segments movable toward and away from the shaft disposed in the pockets and having screw threads at their inner surfaces arranged to engage with and disengage from the screw threads on the shaft, the gear segments having at their ends annularly-extending, outwardly-facing thrust shoulders engagable with their corresponding thrust shoulders at each end of the pockets,



cam means operable to cam the gear segments toward and away from the shaft and thereby the screw threads on the gear segments into and out of threaded engagement with the gear threads on the shaft, and

means operable to rotate the cage thereby rotating the gear segments and driving the shaft axially when the gear threads on the gear segments are in engagement with the gear threads on the shaft.

4,317,385

GENEVA MECHANISM

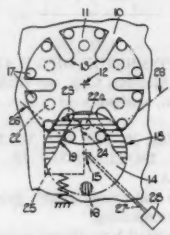
Charles J. Harvey, Kings Coughton, and Christopher G. Wright, Redditch, both of England, assignors to Advance Automation Assembly Limited, Redditch, England

Filed Mar. 19, 1980, Ser. No. 131,752

Claims priority, application United Kingdom, Apr. 11, 1979, 12798/79

Int. Cl.³ F16H *55/00*

U.S. Cl. 74—436 **10 Claims**



1. A geneva mechanism comprising: a relatively fixed structure, a geneva wheel mounted on said structure for rotation about a first axis, a driving member mounted on said structure for rotation about a second axis and being drivingly engageable with said geneva wheel to impart stepwise rotation thereto, first and second detent means respectively rotatable with said geneva wheel and said driving member, said first detent means comprising a plurality of first abutment surfaces arranged on a pitch circle about the axis of rotation of said geneva wheel, and said second detent means comprising a first part-cylindrical surface which in a first relative position of said first and second detent means simultaneously engages two of said first abutment surfaces to prevent rotation of said first detent means and said geneva wheel, a plurality of second abutments carried by said geneva wheel for rotation therewith, the number of said second abutments being equal to the number of steps required to effect one rotation of the wheel, and a spring biased bolt mounted on said fixed structure and sequentially engageable with said second abutments, said bolt being operable in a first relative position to urge said geneva wheel in one direction of rotation, and said bolt being displaceable against its spring bias by successive ones of said second abutments as a result of rotation of said geneva wheel in said one direction.

4,317,386

MECHANISM FOR LUBRICATING AN OUTPUT PILOT BEARING OF A GEAR TRANSMISSION

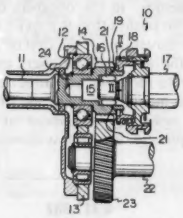
Shiuichiro Ida; Shoichi Ohshima, and Shunichi Hirashima, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyot·, Japan

Filed Dec. 28, 1979, Ser. No. 107,857

Claims priority, application Japan, Oct. 22, 1979, 54-135101

Int. Cl.³ F16H *57/04*

U.S. Cl. 74—467 **1 Claim**



1. A bearing lubrication mechanism of a gear transmission, comprising:

(a) a casing containing lubrication oil;

(b) an input power shaft rotatably mounted in said casing having an axial bore in one end thereof;

(c) an input gear having a root cylinder concentrically and integrally formed with said input power shaft at said one end thereof;

(d) an output power shaft one end thereof being coaxially disposed in the axial bore of said input power shaft;

(e) an output pilot bearing disposed in said axial bore and rotatably supporting the one end of said output power shaft;

(f) a gear piece having a root cylinder rigidly secured to and disposed concentrically and in axial abutting relationship with said input gear at the one end of said input power shaft, the root cylinder of said gear piece being radially larger than the root cylinder of the adjacent input gear and having at least one cavity opening toward said input gear and radially extending from the radial inward portion of the gear piece root cylinder to a position radially outward of the root cylinder of said input gear; and

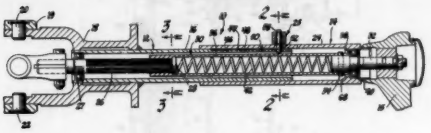
(g) the root cylinder of said input gear having at least one radially inclined oil aperture providing oil communication between the space defined by said cavity and said axial bore proximate said pilot bearing, and said input power shaft having at least one air communication port connecting said axial bore with the space defined by said casing.

4,317,387

TELESCOPING STEERING ASSEMBLY

Ronald I. Myers, Beachwood, and Charles W. Rader, Willowick, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed May 23, 1980, Ser. No. 152,726
Int. Cl.[3] B62D 1/18; G05G 5/18
U.S. Cl. 74—493 2 Claims



1. A telescoping steering assembly comprising a fixed lower column supporting a lower steering shaft formed with an enlarged head at the upper end thereof, an upper column supported by said lower column for axial movement relative to said lower column between two extreme positions; an upper steering shaft including a stub shaft fixed to a hollow cylindrical member and housed within said upper column, a splined connection joining the lower end of said cylindrical member to said lower steering shaft; first bearing means supporting the lower end of said lower steering shaft for rotation in said lower column; second bearing means supporting said stub shaft for rotation in said upper column, a groove formed in the outer surface of said lower column, said groove having a plurality of axially spaced openings formed therein, a lock pin carried by said upper column and having an extended position wherein one end of said lock pin is located within one of said openings for locking said upper column and said lower column against relative telescoping movement, said lock pin having a retracted position wherein said one end of said lock pin is located in said groove; cooperating stop means for maintaining said one end of said lock pin in said groove when said lock pin is in said extended position or in said retracted position so as to prevent relative rotational movement of said upper and lower columns; and a spring located within said cylindrical member with one end of said spring engaging said enlarged head of said lower steering shaft and the other end of said spring engaging said stub shaft for continuously urging said upper column away from said lower column.

4,317,388

GEAR WHEEL WITH VIBRATION DAMPING RINGS

Richard J. Wojcikowski, Toledo, Ohio, assignor to Dana Corporation, Toledo, Ohio

Filed Jul. 6, 1979, Ser. No. 55,460
Int. Cl.[3] F16F 15/10; F16H 55/17
U.S. Cl. 74—574 9 Claims

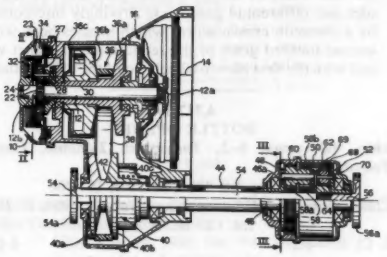
1. A gear wheel comprising: a hub; a toothed rim, including an inner annular surface facing radially inwardly; a web integrally connecting said hub and said rim; a split ring terminating in two closely spaced opposing ends and in engagement with said inner annular surface of said rim; and adjustable wedge means between the ends of said split ring for expanding said split ring, thereby exerting outward pressure on said rim to cause same to go into tensile stress.

4,317,389

VEHICLE DRIVE TRANSMISSION SYSTEM

Gianluigi Falzoni, Turin, Italy, assignor to Fiat Auto S.p.A., Turin, Italy

Filed Dec. 14, 1979, Ser. No. 103,640
Claims priority, application Italy, Jan. 19, 1979, 67122 A/79
Int. Cl.[3] F16H 37/00, 37/08
U.S. Cl. 74—689 1 Claim



1. In a motor vehicle, an improved drive transmission system for transmitting drive from the engine of the vehicle to the half shafts of the vehicle's driving wheels, said system comprising:

a driving shaft connectable at one end to the vehicle's engine to be driven in rotation thereby;

a hollow main shaft coaxially surrounding said driving shaft;

a reversing unit operatively interposed between the main shaft and the end of the driving shaft remote from the engine, the said reversing unit being remotely controllable to assume a selected one of three operating conditions in which said main shaft is respectively arranged to rotate in the same sense as said driving shaft, to rotate in the opposite sense to said driving shaft, and to be drivingly disengaged from the driving shaft;

a driven shaft extending parallel to said main shaft;

a continuously-variable speed control unit including a driving pulley mounted on said main shaft, a driven pulley mounted on said driven shaft, and a V-belt passing around said pulleys, each pulley consisting of two facing conical discs, one of which is integral with the corresponding shaft and the other of which is axially movable along said shaft to effect the radial displacement of the V-belt;

a reduction gear unit drivingly connected to the driven shaft; and

a differential gear driven from the said reduction unit and provided with two output shafts drivingly connectable to the said half shafts of the vehicle's driving wheels, the improvement residing in that said driven shaft is hollow and that said reduction gear unit is of epicyclic form and is arranged coaxially adjacent the differential gear which is also of epicyclic form, the said reduction gear unit being provided with a hollow input shaft coaxial with said driven shaft and drivingly connected thereto, and the differential gear including two rotatable output members coaxial with the driven shaft and fast for rotation with respective ones of said two output shafts, one said output shaft extending through both the said hollow input shaft of the reduction gear unit and the said hollow driven shaft for connection with the corresponding one of the said driving-wheel half shafts,

wherein the reduction gear unit comprises a gear train carrier integral with said hollow input shaft, three planet wheels rotatably mounted on said carrier and equi-angularly spaced around said input shaft, and a crown wheel

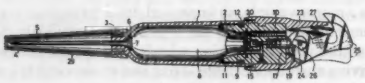
coaxial with the input shaft and integral with the said casing, each said planet wheel being composed of a first toothed gear meshing with the said crown wheel and a second toothed gear side-by-side with the first toothed gear and having a lesser number of teeth than that gear, the said two rotatable output members of the differential gear respectively comprising a sun wheel splined to said one output shaft and a gear train carrier splined to the other said output shaft, the differential gear further including a first and second trio of planet wheels rotatably mounted on the said gear train carrier of the differential gear and so arranged that each wheel of the first trio meshes with a respective one of the wheels of the second trio, the second trio of planet wheels also meshing with the sun wheel of the differential gear and the reduction unit and differential gear being drivingly interconnected by a common crown wheel which meshes both with the second toothed gears of the reduction-unit planet wheels and with the first planet-wheel trio of the differential gear.

4,317,390

BOTTLE OPENER

Michio Nakayama, 6-2, Tamagawa 2-chome, Ohta-Ku, Tokyo, Japan

Filed Sep. 16, 1980, Ser. No. 187,704
Claims priority, application Japan, Jul. 26, 1980, 55-102904
Int. Cl.³ B67B *7/08*
U.S. Cl. 81—3.2 **6 Claims**



1. A bottle opener comprising a bomb filled with an agent for generating gas such as carbon dioxide gas and having a gas outlet port; a cylindrical body encasing said bomb with a predetermined space therebetween; a needle member mounted at one end of said cylindrical body and communicating with said space; a cylinder screwed to the other end of said cylindrical body in which are disposed, a bomb needle facing said gas outlet port of said bomb, a gas flow path communicating with said bomb needle and said space, a piston having at one end a valve for opening and closing said gas flow path which is constantly biased by a first elastic member in a direction for closing said path, and a safety valve communicating with said space; a lid body mounted on said cylinder; a handle for acting on the other end of said piston which is mounted on said cylinder and which is constantly biased by a second elastic member in a closing direction; and airtight sealing members disposed between said bomb and said cylinder, between said bomb and said bomb needle, and between said piston and said cylinder.

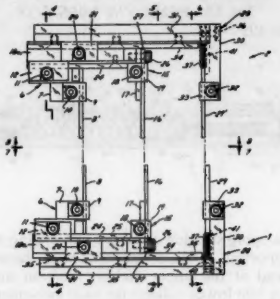
4,317,391

QUICK CHANGE WIRE CUTTING AND STRIPPING BLADE TOOL HOLDER

Ragnar Gudmestad, West Allis, Wis., assignor to Artos Engineering Company, New Berlin, Wis.

Filed Aug. 14, 1980, Ser. No. 178,166
Int. Cl.³ H02B *1/12*
U.S. Cl. 81—9.51 **7 Claims**

1. In an insulated wire cutting and stripping machine, upper and lower tool holders vertically movable with respect to each other for the passage of an insulated wire along a path therebetween, each tool holder having (1) a slide assembly, (2) a slide bar assembly, and (3) a base plate assembly; each of said slide assemblies including a first stripping blade releasably attached thereto, said base plate assemblies each including a second stripping blade releasably attached thereto, and said slide bar assemblies each including a cut-off blade releasably attached thereto and located between said first and second stripping blades, each of said slide assemblies being slideably mounted on its respective slide bar assembly for movement therealong whereby each of said first stripping blades may be moved along said path toward and away from its respective cut-off blade, and each of said slide bar assemblies being slideably mounted on its respective base plate assembly for movement



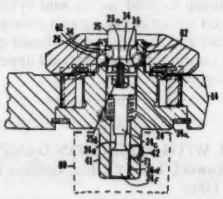
therealong whereby each of said cutoff blades may be moved along said path toward and away from its second stripping blade; means for causing vertical relative movement between said upper and lower tool holders for cooperative cutting and stripping of said insulated wire passing therebetween.

4,317,392

RATCHET WRENCH

Leonard W. Stephens, Fairview, and Mack Salladay, Morgan, both of Pa., assignors to Perry M. Lane, Washington, Pa.

Filed Mar. 30, 1981, Ser. No. 249,061
Int. Cl.³ B25B *13/46*
U.S. Cl. 81—63.1 **11 Claims**

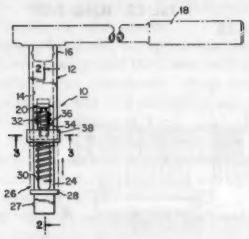


1. A ratchet wrench or the like having a rotatable body, a drive member in the body, means for driving the drive member in either clockwise or counterclockwise directions, a pushbutton for releasing the drive and returning the driving means to neutral, a cap rotatable relative to the drive member for establishing the drive in either the clockwise or counterclockwise direction, a longitudinal passage in the drive member, a longitudinally movable pin in said passage, an aperture in said drive member communicating with said passage, a detent element mounted in said aperture, means for limiting outward movement of the detent in said aperture, the detent being normally engaged with a surface of said pin and held thereby in outwardly located position in order to engage and hold the socket on the drive member, a recess in said pin for selective alignment with said detent element so that the latter is received therein for releasing the socket, a first spring normally urging the pin to a position where it holds the detent outwardly, said pin extending toward said pushbutton, another spring between said pushbutton and said pin for transmitting a force from said pushbutton to said pin to overcome said first spring and release the socket.

4,317,393
EXTENSIBLE TORQUE BAR

Kenneth Graffam, 145 Viola Rd., Suffern, N.Y. 10901

Filed Aug. 25, 1980, Ser. No. 181,399
Int. Cl.³ B25G *1/04*
U.S. Cl. 81—177 A 5 Claims

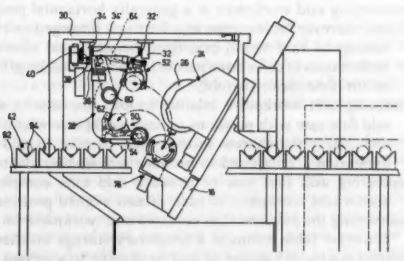


1. An extensible torque bar comprising:
an elongated torque sleeve having a channel therein, and a drive engagement means at one end of the sleeve for engaging a drive tool for applying torque to the sleeve;
an elongated torque rod having a portion of the length thereof adapted to slidably and nonrotatably mate within the channel of the torque sleeve and a driven engagement means at one end of the rod for engaging a driven tool for applying torque to the tool, the rod having internal screw threads along the portion of the length of the rod adapted to slidably and nonrotatably mate within the channel,
a cylindrical adjustment member rotatably and longitudinally mounted to the sleeve, the member having external screw threads cooperably engaging the internal screw threads,
whereby when the cylindrical adjustment member is rotated the elongated torque rod extends from or retracts into the sleeve.

4,317,394
ARRANGEMENT FOR LOADING AND UNLOADING WORKPIECES OF MACHINE TOOLS

Helmut F. Link, Aichwald, and Paul Waiblinger, Esslingen, both of Fed. Rep. of Germany, assignors to Index-Werke KG Hahn & Tessky, Esslingen, Fed. Rep. of Germany

Filed Dec. 5, 1979, Ser. No. 100,538
Claims priority, application Fed. Rep. of Germany, Dec. 14, 1978, 2853949
Int. Cl.³ B23B *13/02*
U.S. Cl. 82—2.5 7 Claims

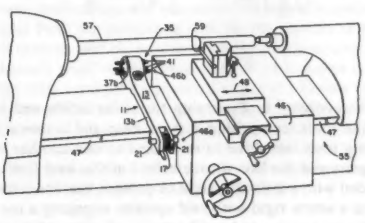


1. An arrangement for loading workpieces on and unloading workpieces from a machine tool having a frame with a central portion located above the machine tool supporting a carriage for shifting movement generally parallel to the axis of the machine tool, said carriage supporting a loading gripper means and an unloading gripper means, said gripper means provided at their front ends with gripper elements movable along respective paths from initial positions to a common terminal position which only intersect at said common terminal position, characterized in that said gripper means comprise a lower first gripper arm (54) pivotable around an axis (58) parallel to the machine tool axis (76) and an upper second compound gripper arm (56) pivotable around an axis (66) parallel to the machine tool axis (76), said second compound gripper arm comprising two portions (62, 64) having an initial position in which they define a downwardly opening direction, and positioning means responsive to movement of said second compound gripper arm from its initial position to its terminal position for steadily increasing the angle defined by said two portions of said second compound arm.

4,317,395
LATHE STOP

Gregory Castano, Brockton, Mass., assignor to Stoughton Tool & Die Co., Inc., Brockton, Mass.

Filed Aug. 21, 1980, Ser. No. 180,382
Int. Cl.³ B23B *3/36*
U.S. Cl. 82—34 D 3 Claims



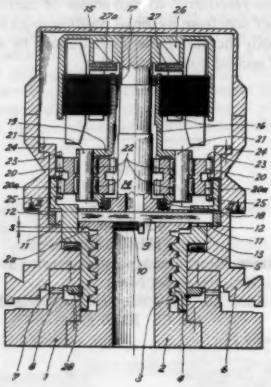
1. In a lathe having a cutting tool carried along a workpiece by a carriage moving on a guide track, apparatus for stopping the movement of said carriage to define precisely the final position of a cut in said workpiece, comprising in combination:
a positionable support bracket securely fastened to said lathe, generally transverse to the direction of movement of said carriage;
a first assembly mounted at one end of said bracket, including
a first stop element disposed within the path of movement of said carriage,
a micrometer adjustment means for making continuous positional adjustments of said first stop element by precise distances in a direction parallel to the direction of movement of said carriage, and
means for fixing said first stop element at selected positions; and a second assembly mounted at an opposite end of said bracket, including
a turret member rotatably mounted to said bracket, and
a plurality of second stop elements secured to said turret member and selectively positionable within said path by rotation of said turret, each of said second stop elements being adjustable in length in a direction parallel to said direction of movement of said carriage.
each of said second stop elements, when positioned within said path, being disposed relative to said first stop element whereby a precise length of said second stop element can be established by alignment with the micrometer adjusted first stop element.

4,317,396

REVOLVING TOOL CARRYING TURRET FOR LATHES

Ettore Zaninelli, San Donato Milanese, Italy, assignor to Baruffaldi Frizioni S.p.A., San Donato Milanese, Italy

Filed Jul. 10, 1980, Ser. No. 168,464
Claims priority, application Italy, Jul. 17, 1979, 24419 A/79
Int. Cl.³ B23B 29/00
U.S. Cl. 82—36 A 6 Claims



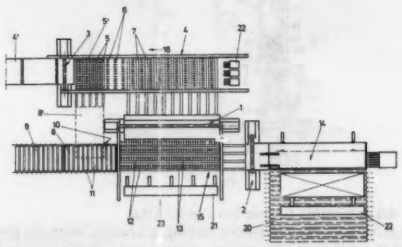
1. A revolving tool carrying turret for lathes and the like machine tools, comprising a fixed base and a movable tool carrying body, effective to be locked to one another by base ring gears and the like, characterized in that said fixed base is provided with a central upright or column, thereon is coaxially formed a screw rigid with said upright, engaging a nut screw effective to revolve and axially move only through a predetermined angle, or axial shifting, corresponding to the movement required for unlocking or locking said base ring gears, said nut screw being axially associated with said tool carrying body, said nut screw and said tool carrying body being able of revolving with respect to one another, said central upright supporting, at the top end thereof, an electric motor therewith is coupled en epicyclical unit having a first end gear wheel rigid with said tool carrying body and a second end gear wheel rigid with said nut screw, between said two end gear wheels one or more planet wheels being located, said planet wheels pertaining to said epicyclical unit, between said fixed upright and said movable tool carrying body locating and locking means being provided formed by a sliding bolt effective to transversely slide within said fixed upright and perpendicularly to the axis thereof, and by locating hollows or slots as formed in said tool carrying body, or rigid therewith, said bolt being biassed by a spring to penetrate for locating one end of said tool carrying body within one said hollow or slot, the other end of said tool carrying body being prevented from moving by an abutment surface rigid with said nut screw, said bolt being effective to exit said one locating hollow or slot by rotating said tool carrying body through the contact of inclined planes of the two portions simultaneously to the aligning with said other end of said bolt of a radial hollow of like size as formed in said abutment surface of said nut screw in order to permit said tool carrying body to move from a position to a next one, said revolving or rotating movements of said nut screw and said tool carrying body being carried out by said planet wheels of said epicyclical unit, when either one or the other of said end wheels locates at a stop position.

4,317,397

SYSTEM FOR THE STAGGERED DIVISION OF PLANAR WORKPIECES

Wilfried Ess, Schwarzach, Austria, assignor to Schelling & Co., Schwarzach, Austria

Filed May 28, 1980, Ser. No. 153,864
Claims priority, application Austria, Jun. 11, 1979, 4147/79
Int. Cl.³ B26D 5/20
U.S. Cl. 83—35 8 Claims



1. A system for effecting staggered division of planar workpieces comprising: conveyer table means upon which said workpieces are movable and held stationery during a cutting procedure; a first crosscut saw and a longitudinal cutting saw constructed to effect cutting from below said table means and arranged to successively divide said workpieces along crosscuts and longitudinal cuts which extend perpendicularly to each other; a second cross-cut saw provided forwardly of said longitudinal cutting saw; stop and conveying means for effecting feeding and correct positioning of workpieces through said system; a first conveyer table feeding workpieces in directions parallel to the cutting directions of said longitudinal saw for feeding workpieces to said first crosscut saw and to said longitudinal cutting saw; a second conveyer table feeding workpieces to said second crosscutting saw; a transfer table arranged between said first and said second conveyer table; and a storage table provided forwardly of said transfer table; said transfer table being arranged to bypass said longitudinal cutting saw and to selectively feed pieces cut by said first crosscut saw from said first conveyer table to either said storage table or to said second conveyer table, and from said storage table to said second conveyer table.

8. A method for cutting a generally planar quadrilateral workpiece into smaller quadrilateral elements, with at least a portion of said quadrilateral elements having both the length and the width dimension thereof smaller than the length and width dimensions of said workpiece comprising the steps of:

conveying said workpiece in a generally horizontal position on conveyer table means to a first saw arranged to effect cutting of said workpiece from beneath said conveyer table means in directions parallel to one of said length and width dimensions thereof;

indexing said workpiece relative to said first saw to align said first saw with positions on said workpiece where cuts completely thereacross in directions parallel to said one dimension are required to produce said smaller elements;

operating said first saw to produce said cuts completely across said workpiece at each of said aligned positions;

conveying the portions thus cut from said workpiece on said conveyer table means to a temporary storage location;

conveying the remainder of said workpiece to a second saw arranged to effect cutting in directions perpendicular to the cutting direction of said first saw from beneath said conveyer table means;

indexing said workpiece remainder relative to said second saw to align said second saw with positions on said workpiece remainder where cuts completely across said workpiece remainder in directions parallel to the other of said

length and width dimensions are required to produce said smaller elements;

operating said second saw to produce said cuts completely across said workpiece remainder at each of said aligned positions;

conveying the pieces of said cut workpiece remainder to a third saw arranged to effect cutting in directions perpendicular to the cutting direction of said second saw from beneath said conveyer table means;

indexing the pieces of said cut workpiece remainder relative to said third saw to align said third saw with positions on said pieces where cuts completely across said pieces in directions parallel to said one dimension are required to produce said smaller elements;

operating said third saw to produce said cuts completely across said pieces at each of said aligned positions;

rotating the portions first cut from said workpiece by said first saw through 90°;

conveying said rotated portions on said table conveyer means to said third saw;

indexing said rotated portions relative to said third saw to align said third saw with positions on said rotated portions where cuts completely across said rotated portions in directions perpendicular to said one dimension are required to produce said small elements; and

operating said third saw to produce said cuts completely across said rotated portions at each of said aligned positions.

4,317,398

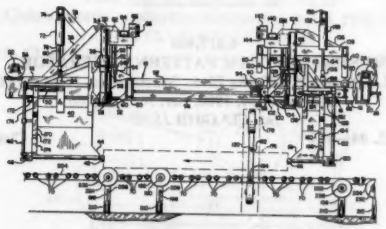
SAWMILL APPARATUS HAVING CANT SUPPORTING MEANS

Aaron U. Jones, Eugene, Oreg.; Marcel R. Trudeau, deceased, late of Eugene, Oreg., and by Claire Trudeau, administratrix, Ville St-Pierre, Canada, assignors to Seneca Sawmill Company, Eugene, Oreg.

Filed Mar. 27, 1980, Ser. No. 134,442

Int. Cl.³ B27B *13/00, 29/08, 31/08*

U.S. Cl. 83—156 **23 Claims**



8. In a sawmill having a carriage provided with dogging means for receiving and engaging the ends of a log, said carriage being movable in a path substantially longitudinal of said log, and a saw disposed in line with the path of said carriage for sawing boards or cants from said log as said carriage moves relative to said saw,

the improvement comprising a rotatable member disposed along the path of said carriage and having a horizontal axis of rotation transverse to the path of said carriage, and means for positioning said rotatable member substantially immediately adjacent the path of said log for engaging the underside of said log after the same passes said saw to support boards and cants sawn from said log whereby to prevent damage to said boards or cants as they are sawn from said log,

wherein said rotatable member comprises at least one wheel circumferentially formed of elastomeric material for engaging said log and said positioning means comprises actuator means for raising said wheel against the underside of said log after the same passes said saw.

4,317,399

DIE CUTTER FOR STAMPING RECTANGULAR OBJECTS WITH ROUNDED CORNERS

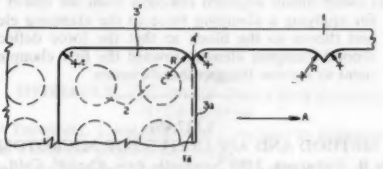
Andrea Romagnoli, San Lazzaro Di Savena, Italy, assignor to I.M.A. - Industria Macchine Automatiche S.p.A., Ozzano Emilia, Italy

Filed Jun. 6, 1980, Ser. No. 157,066

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1979, 2950469

Int. Cl.³ B26F *1/00*

U.S. Cl. 83—237 **5 Claims**



1. A device for stamping generally rectangular objects from a strip of sheet material, comprising:

a support having a cutout of generally rectangular shape;

feed means for intermittently advancing a strip to be cut along said support with lateral edges slightly projecting beyond said cutout; and

a generally rectangular die synchronized with said feed means confronting said cutout for periodically cutting an object from the advancing strip during periods of standstill thereof, said die having quadrantly arcuate corners of relatively small radius at junctions of a transverse trailing edge with a pair of longitudinal edges and further having quadrantally arcuate corners of relatively large radius at junctions of a transverse leading edge with said longitudinal edges, said feed means advancing said strip between cutting strokes of said die by a pitch slightly less than the spacing of said leading and trailing edges.

4,317,400

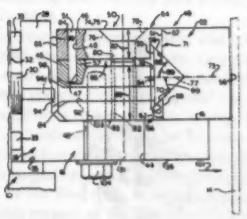
SAW GUIDE CLAMPING ASSEMBLY

Gerald J. Matchette, 3339 - 236 St., Langley, British Columbia, Canada V3A 4P6

Continuation-in-part of Ser. No. 884,609, Mar. 8, 1978, Pat. No. 4,231,274. This application Jul. 29, 1980, Ser. No. 173,280

Int. Cl.³ B23D *55/08;* **B27B** *13/10*

U.S. Cl. 83—820 **11 Claims**



1. A clamping assembly for clamping a guide block of wearable material therein, the block having first and second engaging surfaces adjacent an inner face thereof, and an outer face remote from the inner face to serve as a wearing surface to bear against a wearing element of a machine, the clamping assembly and block being received in a holding means of the machine for location adjacent a machine datum surface, the clamping assembly being characterized by:

(a) a first clamping element having front and rear portions,

the front portion having a first gripping and bearing surface for engaging the first engaging surface of the block,

(b) a second clamping element having front and rear portions, the front portion having a second gripping and bearing surface for engaging the second engaging surface of the block,

(c) spacer means cooperating with the respective rear portions of the first and second clamping elements to maintain a gap between portions of the clamping elements,

(d) complementary alignment means adjacent the spacer means and cooperating with the first and second clamping elements to maintain the clamping elements in alignment with each other and with the block,

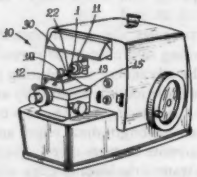
(e) clamp means disposed remotely from the spacer means for applying a clamping force to the clamping elements and thence to the block so that the force deflects the second clamping element toward the first clamping element to narrow the gap therebetween.

4,317,401

METHOD AND APPARATUS FOR MICROTOMY

Dale R. Disharoon, 2480 Newcastle Ave., Cardiff, Calif. 92007

Division of Ser. No. 56,469, Jul. 11, 1979, Pat. No. 4,269,092.
This application Oct. 27, 1980, Ser. No. 201,131
Int. Cl.³ G01N *1/06*
U.S. Cl. 83—856 **10 Claims**



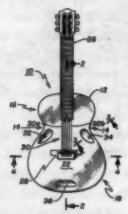
7. A microtome knife element comprising a vitreous carbon body having at least two intersecting substantially plane surfaces forming a substantially linear knife edge having a length of at least about 2 millimeters and having a radius of curvature of less than about 5μ.

4,317,402

ACOUSTIC GUITAR

Mathew McPherson, Sr., 5817 Olinger Rd., Edina, Minn. 55436

Filed Jan. 28, 1980, Ser. No. 229,092
Int. Cl.³ G10D *1/08*
U.S. Cl. 84—291 **16 Claims**



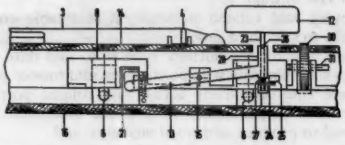
1. In an acoustic guitar of the type having a body including a sound board and a back, a plurality of strings including bass and treble strings positioned above the sound board, and a bridge on the body sound board in the lower bout for receiving the strings, the improvement comprising an arrangement of three spaced sound holes in the sound board, the first hole being substantially located between the bridge and upper bout and between the bass strings and the adjacent edge of the guitar body sound board; the second hole being substantially located between the bridge and upper bout and between the treble strings and the adjacent edge of the guitar body sound board; and the third hole being located in the lower bout.

4,317,403

DEVICE FOR CONTINUOUS PITCH VARIATION OF STRINGED INSTRUMENTS

Rainer Franzmann, Rehhagweg 9, 7800 Freiburg, Fed. Rep. of Germany

Filed Sep. 3, 1980, Ser. No. 183,694
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1979, 2908766
Int. Cl.³ G10D *3/00*
U.S. Cl. 84—313 **9 Claims**



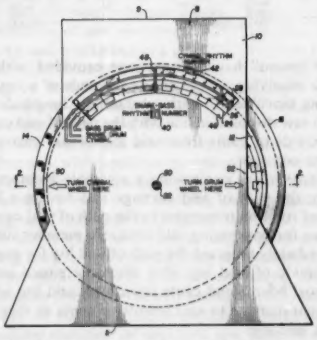
1. A stringed musical instrument comprising two parts movable relative to each other to vary the tension on the strings during playing, thereby to vary the pitch of the sound produced by the strings, releasable locking means operable to lock said two parts against movement relative to each other and to unlock said two parts to allow movement of said two parts relative to each other, a control member mounted on said instrument in position to be engaged by an arm of a person playing the instrument, and means responsive to pressure of the player's arm on said control member for operating said locking means, one of said two parts being the body of the instrument and the other of said two part being a movable neck portion of the instrument.

4,317,404

MUSICAL RHYTHM PATTERN GENERATOR

John Lombardo, 277 Clarks Blvd., Massapequa, N.Y. 11758

Filed Mar. 24, 1980, Ser. No. 133,266
Int. Cl.³ G09B *15/02*
U.S. Cl. 84—474 **11 Claims**



1. A musical rhythm pattern generator, comprising:
a holder having a front face;

a first disc rotatably mounted with respect to said holder behind the front face thereof;

a second disc rotatably mounted with respect to said holder behind said first disc so as to be independently rotatable with respect to said first disc about a common axis, said second disc having a larger diameter than said first disc;

a first plurality of different musical rhythmic note patterns provided in a first circle on the face of said first disc facing said front face of said holder, said first circle of rhythmic note patterns being disposed near the periphery of said first disc; and

a second plurality of different musical rhythmic note patterns provided in a second circle on the face of said second disc facing said first disc, said second circle of rhythmic note patterns being centered on the axis of said second disc and having a diameter greater than the diameter of said first disc;

wherein said first and second rhythmic note patterns are so disposed in their respective circles on said first and second discs such that each arc segment of predetermined fixed angular measurement of said circles of note patterns corresponds to a given constant musical time interval, the time value of any rhythmic note pattern combination within said predetermined arc segment equaling said musical time interval regardless of the number of musical symbols necessary to total said given musical time interval, and

wherein said front face of said holder has a first window therein in the vicinity of the outer periphery of said first disc, said first window being shaped such that a portion of said concentric first and second rhythmic note pattern circles are visible therethrough.

4,317,405

APPARATUS FOR SUPPORTING A WEAPON SYSTEM UPON A COMBAT VEHICLE

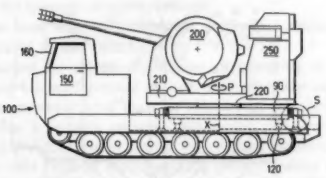
Walter Ebner, Wettingen; Werner Kramis, Schwerzenbach, and Gustav Studer, Dällikon, all of Switzerland, assignors to Contraves AG, Zurich, Switzerland

Filed Jun. 27, 1979, Ser. No. 52,337

Claims priority, application Switzerland, Jul. 5, 1978, 7319/78

Int. Cl.³ F41F *23/06, 23/34*

U.S. Cl. 89—37 G **9 Claims**



1. An apparatus for supporting a weapon system upon a mobile combat vehicle, comprising:

a combat vehicle-chassis frame;

a platform upon which the weapon system is mounted for rotational movement about a substantially vertical axis;

an intermediate frame;

three support devices arranged in spaced relationship from one another for mounting the weapon system arranged at the platform together with the intermediate frame at the chassis frame of the combat vehicle;

said support devices being operatively connected with the intermediate frame and the chassis frame;

said support devices being structured for taking-up angular and displacement movements and, viewed in the travel direction of the vehicle, for lowering and raising the intermediate frame supporting the weapon system at least at one side in relation to the chassis frame;

a respective displacement cylinder means operatively connected with the intermediate frame and the chassis frame and provided for each of the support devices;

said support devices including two support devices arranged at an end region of the intermediate frame; and

said two support devices, viewed in the plane of the intermediate frame, being arranged at an angle with respect to one another in the order of about 120°.

4,317,406

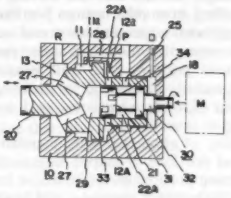
HYDRAULIC CYLINDER FOR GENERATING VIBRATIONS

Ikuo Takahashi, Yokohama, Japan, assignor to Kabushiki Kaisha Takahashi Engineering, Japan

Continuation of Ser. No. 907,071, May 18, 1978, abandoned. This application Jul. 23, 1980, Ser. No. 171,527

Int. Cl.³ F15B *21/02, 15/17*

U.S. Cl. 91—39 **4 Claims**



1. A hydraulic device, for generating vibratory motion, comprising:

(i) a cylinder body having a supply connection port and an exhaust connection port opening into its interior for passage of hydraulic pressure fluid medium,

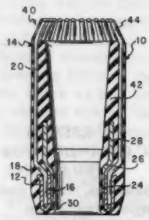
(ii) a piston slidable within said cylinder body and including a valve chamber, said piston comprising radial flange means having at axially opposite sides thereof a larger face and a smaller face, a first chamber being defined by said larger face and the inner surface of the cylinder body, a second chamber being defined by the smaller face and the inner surface of the cylinder body, the second chamber communicating with the supply port, the first chamber communicating with valving port means opening into the valve chamber,

(iii) a valve rotor positioned within and rotatable about an axis within said valve chamber, said rotor including a change-over valve portion having an outer circumferential surface disposed opposite to said valving port means, said change-over valve portion having therein first and second circumferential trains of notches opening at said outer circumferential surfaces, the notches of each train being arranged at equal circumferential intervals, the notches of the first train being arranged angularly alternately with respect to the notches of the second train, the notches of the first train being permanently in communication with the supply connection port, the notches of the second train being permanently in communication with the exhaust connection port, the first and second trains of notches being disposed at different axial positions on the rotor such that, when the piston is in a central position of its stroke within the cylinder body, axially-adjacent ends of the notches of the two trains lie between the planes normal to the axis of rotation of the rotor which respectively coincide with the opposed axial limits of the valving port means.

4,317,407
SWAB CUP HAVING AN INTERNAL REINFORCING MEMBER

Henry W. Blackwell, Venus, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Feb. 19, 1980, Ser. No. 122,223
Int. Cl.[3] B29F 1/10; F16J 9/08, 15/32
U.S. Cl. 92—241 9 Claims



1. An improved swab cup assembly comprising:

(a) a unitary base member of U-shaped cross-section formed from a single annular member having an inner opening and including an annular bottom portion having inner and outer peripheral edges and inner and outer wall portions from the respective inner and outer peripheral edges of said bottom portion, said wall portions extending in spaced, generally concentric parallel relationship forming an annular slot there-between, said inner wall portion including an inner surface;

(b) a plurality of elongated wire members having straight lower end portions, S-shaped intermedite portions, side wall forming portions over the major length thereof; and inwardly bent upper portions, said lower portions being disposed in said slot in circumferentially spaced relationship and in tight, frictional engagement with said wall portions whereby the lower end portions of said wire members are retained immobile with respect to said base member and each other;

(c) a hollow reinforcing member having a smaller diameter portion, a larger diameter portion and a transition portion integrally connected therebetween, said smaller diameter portion extending through the inner opening of said base member along said inner wall portion thereof with said transition portion positioned above said inner peripheral edge and said larger diameter portion positioned along the mid-portion of said side wall portions of said wire members, and means for rigidly securing said smaller diameter portion with said unitary base member against said inner surface to lock said reinforcing member against separation from said base member; and

(d) elastomeric body means encapsulating said base member, said hollow reinforcing member and said wire members for forming said members into an annular swab cup assembly.

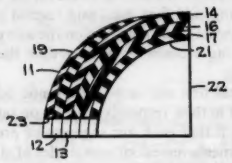
4,317,408
WEAR RESISTANT PUMP PACKING CUP

Michael R. Williams, Jonesboro, Ark., assignor to FMC Corporation, Chicago, Ill.

Continuation of Ser. No. 918,006, Jun. 22, 1978, abandoned.
This application Apr. 21, 1980, Ser. No. 142,505
Int. Cl.[3] F16J 9/08
U.S. Cl. 92—241 6 Claims

1. In combination with a pump of the type wherein a packing holder is disposed for reciprocating motion in the pump cylinder, and wherein a packing is adapted to be carried by the packing holder and to be received in engagement with the inner wall of the cylinder, the packing including three or more fabric reinforced uniform discs of elastomeric material bonded together in a mold under heat and pressure to form a rigid and generally hemispherical cup having a layered construction and having a smooth convex rear surface and a concave front surface with a cup lip extending between the rear and front surfaces at the open end of the cup, wherein the improvement comprises an improved packing construction comprised of

a fabric reinforced disc of elastomeric material having a high degree of hardness defining a major portion of the convex rear surface of the packing, the perimeter of said disc terminating on the smooth convex rear surface of the packing cup outside the annular area defined by contact between the rear surface of the cup and the inner wall of the cylinder during both the compression and return strokes of the pump,

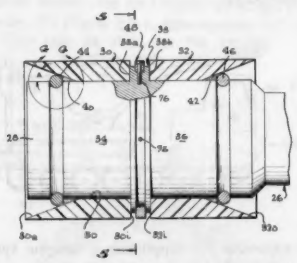


and successive ones of the plurality of discs in a layered sequence terminating on the smooth convex rear surface of the packing within the annular area defined by contact between the rear surface of the cup and the inner wall of the cylinder and being made of elastomeric material of succesively lesser hardness and with the perimeter of said successive discs terminating at positions progressively closer to said cup lip as the hardness decreases, whereby extrusion of the packing between the packing holder and the cylinder wall is resisted by the external higher hardness material.

4,317,409
MUD PUMP PISTON ASSEMBLY

Clifford C. Bottoms, Rte. 2, Box 184L, McKinney, Tex. 75069

Filed Mar. 3, 1980, Ser. No. 126,339
Int. Cl.[3] F16J 9/08
U.S. Cl. 92—244 1 Claim



1. A mud pump piston assembly comprising:

a piston rod having a shoulder and a groove spaced from the shoulder;

a hollow piston sealing member lying about said rod, said piston member having a first end supported by said shoulder and a second end lying adjacent to said groove;

a retainer ring lying in said groove;

a pressure ring lying closely between said second end of said piston member and said retainer ring, to support said second piston member end against said retainer ring;

said second end of said piston member forming a concave face, and the side of said pressure ring adjacent thereto being formed to closely mate with said concave face, but said pressure ring leaving most of the concave face of the piston member uncovered;

said retainer ring having a larger outside diameter than said pressure ring, and the periphery of said retainer ring lying adjacent to said concave face of said piston to leave a narrow passage between them which is narrower than half the radial thickness of the pressure ring.

4,317,410

DEVICE FOR TRANSFORMING AN ENCLOSURE OR CONTAINER INTO A SELF-EVACUATING CONTAINER AND CONTAINER COMPRISING SUCH A DEVICE

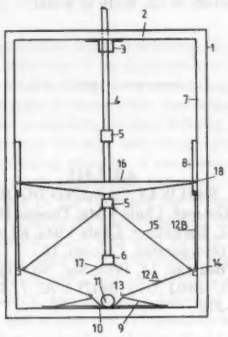
Achille Prunet, Couffouleux, 81800 Rabastens, France

Filed Aug. 8, 1979, Ser. No. 64,844

Claims priority, application France, Aug. 16, 1978, 78 23948; Feb. 19, 1979, 79 04336

Int. Cl.³ C12G *1/02*

U.S. Cl. 99—277.2 **14 Claims**



1. A device for transforming an enclosure or container, such as a vinification container adapted to receive a fluid such as pressed grapes which fluid is adapted to be separated by decantation into a liquid such as wine and a residue comprising particulate solids, such as marc cake, into a self-evacuating container, said device comprising:

(a) an axially arranged rotating evacuation device positioned in a channel, said channel being adapted to be positioned at the bottom of said container;

(b) at least one movable wall journalled around an axis parallel to said panel;

(c) means for selectively raising or lowering at least one movable wall around its axis, and whereby said at least one movable wall may be raised and lowered so as to define a variable volume, said raising or lowering means thereby comprising means for creating liquid currents to stir said fluid as well as means for facilitating rupture of said marc cake, mixture of said marc cake with said liquid, and evacuation of said marc cake from said container.

4,317,411

ROTARY PEANUT AND BLANCHING APPARATUS

James T. Forrest, Sylvester, and Robert L. Thornton, Moultrie, both of Ga., assignors to Seabrook Blanching Corporation of Georgia, Sylvester, Ga.

Continuation of Ser. No. 23,969, Mar. 26, 1979, abandoned. This application Aug. 7, 1980, Ser. No. 176,106

Int. Cl.³ A23N *5/01*

U.S. Cl. 99—623 **8 Claims**

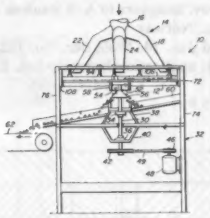
1. Apparatus for blanching peanuts and the like, comprising

(a) a horizontally disposed circular table mountable for rotation about a vertical axis and adapted to carry peanuts deposited on the upper surface thereof, said upper surface being generally flat over the entire extent thereof and of a frictional character,

(b) drive means connected to said table for rotating said table about said axis,

(c) peanut feeding means operatively associated with said table for delivering at least one stream of peanuts onto the upper surface of said table,

(d) at least one guide member having an abrasive working face mounted in relatively fixed position and closely spaced relation to the upper surface of said table and extending generally from the periphery of said table con-



tinuously to the center portion thereof and at an angle to the radius of said table whereby said peanuts carried by said table will roll against only said fixed working face along a smooth continuous path extending from the periphery of said table to the center portion thereof to be blanched thereby,

(e) said guide member being in the form of a spiral orginating near the center portion of said table and terminating near the outer edge thereof.

4,317,412

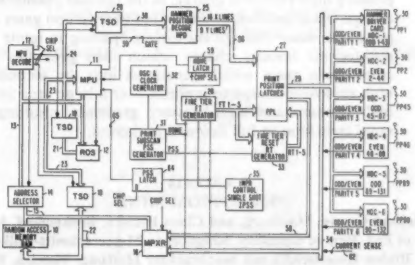
CONTROL SYSTEM AND METHOD FOR TESTING PRINT HAMMERS IN A HIGH SPEED PRINTER

Richard D. Bolcavage, Kirkwood; Michael D. Hryck, Endwell; William B. Kauczka, Endicott, and Harold B. Kinter, Binghamton, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 25, 1980, Ser. No. 162,994

Int. Cl.³ B41J *9/38*

U.S. Cl. 101—93.01 **21 Claims**



1. A method of testing the operation of the print hammers in a row of print hammers arranged to impact a print medium with type characters on a movable type element such as belt or the like,

said hammers being individually operable for printing by a control means for energizing individual electrical hammer operating circuits for a duration sufficient to cause said print hammers to cause characters to be printed on said print medium, and

means for generating feedback signals indicative of the operation of said hammer operating circuits,

said method comprising energizing each of said electrical

operating circuits for a second duration too short to cause printing to occur on said print medium but long enough to cause generation of said feedback signals,

and sensing said feedback signals to determine the operation condition of said print hammer following operation for said second duration.

4,317,413

DETONATOR ELEMENT

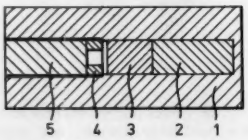
Kare R. Strandli; Thomas Middleton, and Jarle Fjeldstad, all of Raufoss, Norway, assignors to A/S Raufoss Ammunisjonsfabrikker, Raufoss, Norway

Filed Jan. 14, 1980, Ser. No. 112,121

Claims priority, application Norway, Jan. 12, 1979, 790101

Int. Cl.³ F42C *9/00*

U.S. Cl. 102—275.9 **5 Claims**



1. A delay detonator element having a delay time of between 0.1 to 5.0 milliseconds, comprising:

a tube having side walls having a thinner, thin-walled base,

a pyrotechnic ignition charge in said tube, spaced from the base, said pyrotechnic ignition charge of a composition capable of generating hot combustion gases,

a nozzle positioned in the tube adjacent said pyrotechnic charge on the side thereof facing the base, said nozzle having an opening therethrough,

a pyrotechnic booster charge adjacent the nozzle on the side thereof opposite from the pyrotechnic ignition change, said pyrotechnic booster charge of a composition capable of generating hot combustion gases,

the said nozzle opening being smaller in cross-section than cross-section of the pyrotechnic booster charge,

a secondary high explosive charge between the pyrotechnic booster charge and the said base,

whereby, detonation occurs in the absence of a sensitive primary high explosive charge, as the ignition pyrotechnic charge, upon ignition, generates hot combustion gases and passes the same through the nozzle opening to ignite the pyrotechnic booster charge which then generates hot combustion gases which penetrates into the secondary high explosive charge to ignite it over a large area under high pressure and high pressure gradients, resulting in rapid transition to full detonation thereof.

4,317,414

SEA-BOTTOM MINE

Helmut Grawe, Hamburg, and Claus Petters, Brekendorf, both of Fed. Rep. of Germany, assignors to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung, Munich, Fed. Rep. of Germany

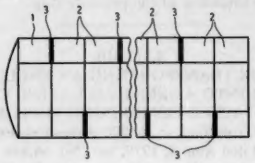
Filed Jul. 2, 1976, Ser. No. 703,140

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1975, 2530616

Int. Cl.³ F42B *22/00*

U.S. Cl. 102—406 **10 Claims**

1. A sea-bottom mine such as is actuated by a remote-control ignition device, comprising at least one operational part and a plurality of explosive sections, means for interconnecting said operational part to at least one said explosive section and for interconnecting said explosive sections so that said operational part and explosive sections can be combined together in an elongated column-like storage arrangement and when thrown into a body of water, said operational part and said explosive sections become displaced from the column-like storage arrangement and move relative to one another so that said operational part and explosive sections remain interconnected and



extend from one another in a direction transverse to the elongated direction of the column-like storage arrangement and rest on the bottom of the body of water.

4,317,415

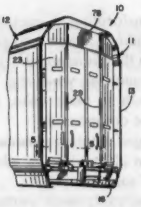
RAILWAY CAR END DOORS

Felixberto A. Galasan, Chula Vista; Thomas H. Watson, Bonita, and Robert L. Barkhimer, Chula Vista, all of Calif., assignors to Pullman Incorporated, Chicago, Ill.

Filed Jan. 14, 1980, Ser. No. 111,562

Int. Cl.³ B60J *5/10*; B61D *3/02, 17/06, 19/00*

U.S. Cl. 105—378 **9 Claims**



1. In a railway car having a body including side walls and a roof structure

said body having a loading end and lower and upper cargo supporting horizontal decks adapted to be loaded with cargo through said loading end the improvement comprising;

a door arrangement including a pair of door structure ends including inner and outer vertical door panels

first hinge means interconnecting said inner and outer door panels,

second hinge means including lower and upper hinge brackets rigidly connected to said outer door panels,

each said hinge bracket having a hinge end portion spaced a substantial distance inwardly from said outer door panels,

pivot means for connecting each said hinge end portion to said upper and lower decks comprising spherical bearing members for providing universal movement, and

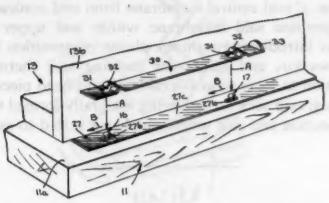
said pivot means for connecting each said hinge end portion to said upper and lower decks located a substantial distance inwardly from an adjacent side wall and inwardly from the loading end of said body whereby said inner and outer vertical door panels may be folded together and rotated about said hinge ends to a position parallel to an adjacent side wall.

4,317,416

CONNECTION MEANS FOR ASSEMBLING FURNITURE

Carl M. Baum, Kings Point, and William C. Rohe, Hicksville, both of N.Y., assignors to Vanguard Diversified, Inc., Brooklyn, N.Y.

Filed Dec. 17, 1979, Ser. No. 104,108
Int. Cl.³ A47B *13/00*; F16B *12/10*
U.S. Cl. 108—157 **5 Claims**



1. Furniture connection means connecting the underside of a horizontal top component of the furniture to a horizontal and longitudinally extending flange on a supporting component of the furniture which are in face-to-face contacting relation, said connection means comprising means defining a plurality of spaced-apart apertures through said flange along the length thereof, a corresponding plurality of correspondingly spaced-apart studs respectively attached to, and projecting outwardly from said underside of the furniture top component and extending through respectively associated ones of said apertures in said flange portion, each said stud having a shank and a laterally protruding head on the outwardly projecting end of said shank, said heads providing connection shoulders of said studs facing towards, and spaced a common distance away from said flange, and at least one elongated locking clip retaining said face-to-face contacting relation of said flange and said top component, each said locking clip being of thin, resilient and initially flat material and having length to extend across the locations of at least two adjacent ones of said studs and further having at least one pair of substantially arcuate protrusions in the same direction out of its initial plane to provide at least one pair of spring portions of the clip in longitudinally spaced-apart relation within the length of the clip corresponding to the spacing between said two adjacent ones of said studs and having common height at least equal to said spacing distance of said stud shoulders away from said flange, said pair of spring portions being between and engaging said flange and the respective of said shoulders of said two adjacent studs, and each said clip further having means defining a keyhole-shaped opening therethrough associated with each said spring portion, each said opening having a slot portion and widened aperture portion at an end of said slot portion, said aperture portions of said openings being located within said initial plane of the clip and having size to receive one of said stud protruding portions therethrough, and said respective slot portions of said openings associated with said one pair of said spring portions facing in the same direction relative to the length of said clip and respectively extending from its said associated aperture portion across its said associated spring portion protrusion, each of said slot portions being in slidable engagement on the stud shank beneath the connection shoulder of said stud which is associated with the spring portion.

4,317,417

INCINERATOR APPARATUS AND METHOD OF UTILIZING THE CLEANED WASTE GASES THEREOF

Samuel Foresto, 243 Willis Ave., Mineola, N.Y. 11501

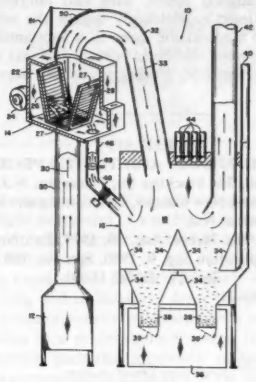
Filed Jan. 2, 1981, Ser. No. 221,974
Int. Cl.³ F23B *5/00*
U.S. Cl. 110—211 **38 Claims**

1. An incinerator apparatus comprising an incinerator and a chimney connected with said incinerator and along which waste gases are directed to flow therethrough from the incinerator,

a scrubber connected with and substantially directly above said incinerator by said chimney and through which the waste gases are flowed,

said scrubber including means to consume residue entrained in the waste gases to scrub clean the waste gases of the residue,

a heat accumulator connected by said chimney with said scrubber and below the same, said heat accumulator having a heat accumulator chamber of larger volume than the cross-section of said chimney,



said chimney including means connecting said scrubber with said accumulator to conduct the scrubbed waste gases to exhaust the same directly from said scrubber to said accumulator,

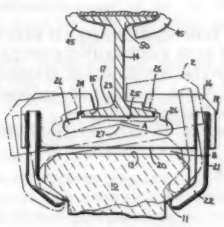
and means in said accumulator for directing the flow of the waste gases therefrom for performing work by extracting heat from such waste gases.

4,317,418

TILE HANGER ASSEMBLY

Jacob B. Courshon, Jr., Park Forest, and Nicholas G. Rutkay, Lake Forest, both of Ill., assignors to Plibrico Company, Chicago, Ill.

Filed Jan. 11, 1980, Ser. No. 111,203
Int. Cl.³ E06B *3/04*; E04B *5/52*
U.S. Cl. 110—331 **3 Claims**



1. A tile hanger assembly for anchoring refractory tile material to the roof of a furnace structure, including in combination;

an I-beam member having upper and lower horizontal portions,

a clamping member engageable with the roof of the furnace structure, said clamping member including a pair of adjustably spaced leg portions having lower inturned end portions which are adapted to engage and support said upper horizontal portion of said suspended I-beam,

fastening means engageable with each of the adjustably

spaced leg portions and the roof of the furnace for mounting the spaced leg portions to the roof of the furnace structure, and

tile anchor means comprised of a pair of vertically spaced apart plates each having aligned cutouts in the upper edges thereof which are adapted to engage said lower horizontal portion of said suspened I-beam and each having lower edges, a pair of rods each having an intermediate bight portion turned inwardly and facing one another, said ends of said rods being mounted to the ends of said vertically aligned plates, with said intermediate bight portion adapted to yieldingly engage the refractory tile material to suspend the same in a substantially vertical position between said bight portion and said lower edges of said plates without placing a pinching stress on the tile material.

4,317,419

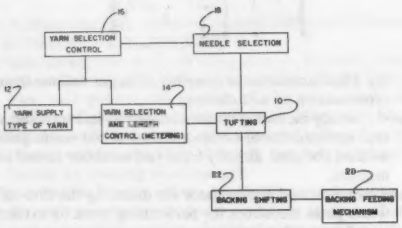
METHOD, MEANS, AND TUFTED PRODUCT

Abram N. Spanel, 344 Stockton St., Princeton, N.J. 08540, and David R. Jacobs, New Canaan, Conn., assignors to Abram N. Spanel, Princeton, N.J.

Division of Ser. No. 71,164, Aug. 30, 1979, Pat. No. 4,244,309. This application Sep. 9, 1980, Ser. No. 188,918

Int. Cl.³ D05C *15/00*

U.S. Cl. 112—266.2 **9 Claims**



1. A method of producing a tufted product by an automatic tufting machine comprising the steps of:

(a) selecting a location for each tuft not necessarily in row-like regimentation;

(b) choosing at each selected location whether or not to implant a tuft therein;

(c) selecting a yarn of choice for each tuft to be implanted;

(d) selecting a length of choice for each selected yarn; and,

(e) implanting the tufts into a backing layer.

4,317,420

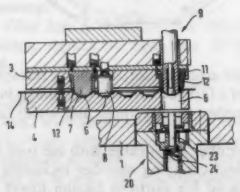
APPARATUS FOR MAKING HEAD PIECES WITH A MEMBRANE FOR PACKAGING CONTAINERS OF LAMINATE WITH A METALLIC BARRIER LAYER

Engelbert Sander, Vouvry, Switzerland, assignor to Automation Industrielle SA, Vouvry, Switzerland

Filed Sep. 27, 1979, Ser. No. 79,565

Int. Cl.³ B21D *39/03*

U.S. Cl. 425—112 **12 Claims**



1. Apparatus for producing a unitary construction head piece for a container from a laminate, said laminate having a gas barrier layer which comprises means for moving said laminate through a molding station to form a circular head piece blank having a conical section and a central membrane at the apex of said conical section, a stamping station comprising a lower section having a through-hole with a cutting edge at the top of said through-hole and an upper section having a stamping punch capable of passing into said through-hole to cooperate with a pusher rod in said lower section to effect separation of said central membrane from said conical section and to position said membrane within said upper section, means for introducting a thermoplastic composition into said conical section, and means for molding said thermoplastic composition to form a neck section of said head piece having an opening, said neck section being integrally formed with said conical section and said membrane being sealed to said opening.

4,317,421

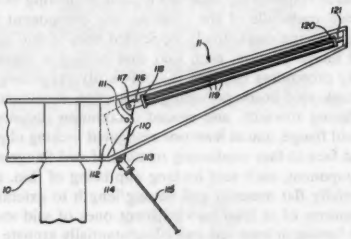
MOORING LINE HANDLING APPARATUS

Jack Pollack, Winfield, Ill., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.

Division of Ser. No. 868,814, Jan. 12, 1978, Pat. No. 4,178,870. This application Apr. 20, 1979, Ser. No. 31,769

Int. Cl.³ B63B *21/00*

U.S. Cl. 114—230 **3 Claims**



1. A mooring line handling apparatus comprising:

a sheave axially mounted on a shaft secured to a base,

a first line wrapped for at least part of its length on the sheave,

at least one first elastic line extending from the first line to one end of a pivotally mounted lever, and

at least one second elastic line extending from the other end of the lever to an anchor means;

whereby said at least one first elastic line and at least one second elastic line resist, by means of the elasticity of the elastic lines means, unwrapping of the first line from the sheave when a load is applied to the first line.

4,317,422

BIKE FOR TRAVELLING OVER WATER

Naeem B. Gabriel, 20 Smith St., Jersey City, N.J. 07306

Continuation of Ser. No. 41,704, May 23, 1979. This application Aug. 21, 1980, Ser. No. 180,091

Int. Cl.³ B60F *3/00*

U.S. Cl. 114—270 **1 Claim**

1. A bike for traveling over a water surface which comprises:

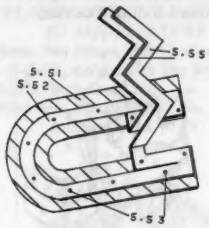
a U-shaped float for partially surrounding a front wheel of the bike;

a U-shaped float for partially surrounding a rear wheel of the bike;

a U-shaped bar attached to the top of each of the U-shaped floats, said U-shaped bar providing means for attaching each U-shaped float to the bike adjacent its respective wheel, said attaching means comprising said U-shaped bar at each of its ends first being bent inwardly in a U-shaped manner, and then being bent upwardly so as to form a

vertical section, said vertical section being further bent into a W-shape;

a disk for powering said bike, said disk having a central opening for receiving an axle, said disk further comprising a plurality of sections adapted for propelling the bike over the water surface,



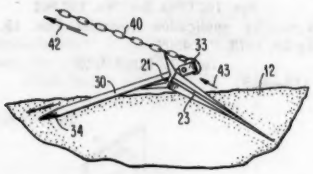
said sections being of one-half hyperboloid shape and being attached to the disk in aligned pairs; one on each side of the disk;

wherein said bike is supported on the water surface by said U-shaped floats and is propelled over the water surface of said powering disk.

4,317,423
ANCHOR

Don J. Marshall, Box 157, 1087 Rodgers Rd., Churchton, Md. 20733

Continuation of Ser. No. 963,040, Nov. 22, 1978, abandoned. This application Sep. 22, 1980, Ser. No. 189,322
Int. Cl.³ B63B *21/44*
U.S. Cl. 114—297 **10 Claims**

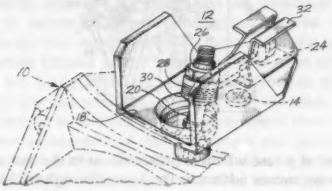


1. An anchor for holding in a bottom underlying a body of water, said anchor comprising in combination; a crown portion having a spaced apart pair of flukes projecting therefrom; means defining an aperture in said crown intermediate said flukes, a shank element extending through said aperture and dimensioned for sliding movement in said aperture and intermediate said flukes; means on said shank element for attaching an anchor line thereto, a sharp pointed, spade-like minor fluke projection on one end of said shank element to limit the sliding motion of said shank portion through said aperture in a first direction, said aperture and shank dimensioned to allow rotational movement of the shank relative to the plane of said flukes and crown whereby upon reversal of the direction of pull on said shank by said anchor line, rotation of said shank element occurs, said shank element slides rearwardly through said aperture and said sharp pointed, spade-like minor fluke projection digs into the bottom underlying said body of water and acts as a fulcrum for said shank element for fluke release from said bottom.

4,317,424
TORQUE LIMITER TRIP INDICATOR

Stephen T. Steadman, Redmond, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jun. 19, 1980, Ser. No. 160,890
Int. Cl.³ B60Q *1/26*
U.S. Cl. 116—56 **5 Claims**



1. An indicator mechanism for providing an indication of a relatively slight movement of a member, said indication being continuous until the indicator mechanism is reset, the indicator mechanism comprising:

a pivoting crank means having a relatively short and a relatively long arm as measured from the pivot, said crank being predeterminedly positioned with said crank short arm being in a predetermined spaced relationship with said member such that movement of said member produces a corresponding deflection of the short arm thereby producing an amplified deflection of said long arm;

a flag arm extending from said long arm for movement therewith; and

a retainer fixedly mounted with respect to said pivoting crank and positioned to engage and retain said flag arm upon reset of the indicating mechanism, the flag arm and retainer cooperating such that movement of said lever as amplified through said pivoting crank causes said flag arm to remove from and disengage said retainer until such time that the flag arm is forcibly reset.

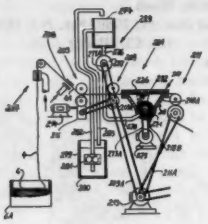
4,317,425
APPARATUS FOR APPLYING PLASTICIZER TO FIBROUS FILTER MATERIAL IN FILTER ROD MAKING MACHINES

Heinz Greve; Peter Grumer, and Rolf Gömann, all of Hamburg, Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

Continuation of Ser. No. 956783, Nov. 1, 1978, abandoned, which is a continuation-in-part of Ser. No. 255,032, May 19, 1972, Pat. No. 4,132,189. This application Sep. 26, 1980, Ser. No. 191,286
Claims priority, application Fed. Rep. of Germany, Jun. 2, 1971, 2127293; Sep. 20, 1971, 2146897; Dec. 1, 1971, 2159428
The portion of the term of this patent subsequent to Jan. 2, 1996, has been disclaimed.
Int. Cl.³ B05C *5/00*
U.S. Cl. 118—33 **9 Claims**

1. Apparatus for applying liquid plasticizer to the filaments in layers of fibrous filter material, comprising means for moving a layer of fibrous material along a predetermined path through an impregnating station at which one side of the layer faces downwardly; a source of plasticizer; an atomizing device including a substantially funnel-shaped receptacle having an open top facing said one side of the layer at said station, said receptacle including a lower portion and said atomizing device further including a rotary brush installed in said lower portion and having bristles contacting said receptacle during each revolution of said brush, and means for rotating said brush; and means for supplying liquid plasticizer from said source to said lower portion of said receptacle so that said bristles entrain, atomize and propel the thus supplied plasticizer against said

one side of the layer at said station, said supplying means comprising means for delivering to said lower portion liquid



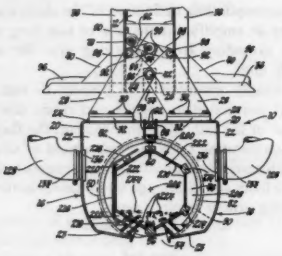
plasticizer at a rate which is proportional to the rate at which said moving means advances the layer through said station.

4,317,426

BLOW-OFF APPARATUS FOR ARTICLES WITHIN TUMBLING BARREL

Charles E. Wheten, Hilton, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 5, 1981, Ser. No. 240,917
Int. Cl.³ B05C *3/00*
U.S. Cl. 118—418 **3 Claims**



1. An apparatus for directing a forceful gas stream through a plurality of articles contained within a barrel having a perforated peripheral wall when said barrel is oriented such that said articles are collected in a pile overlying a portion of said wall, said apparatus comprising

gas-impervious barrel enclosure means sized and shaped to be positioned about the barrel to cover the portion of the peripheral wall that does not lie adjacent the articles such that gas leaving the barrel must flow through the pile to reach the ambient atmosphere, and

means for admitting gas into the enclosure means when in position about the barrel to force gas into the barrel through the covered portion of the peripheral wall and out the uncovered portion.

4,317,427

CARRIER FOR ROTATABLY HOLDING KINESCOPE FACEPLATE DURING PROCESSING

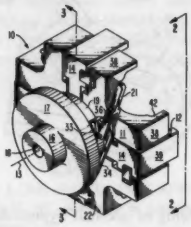
Clarence C. Turner, Marion, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 30, 1980, Ser. No. 164,686
Int. Cl.³ B05C *11/14*
U.S. Cl. 118—503 **5 Claims**

1. A carrier for rotatably holding objects during processing comprising:

a support plate including a plurality of retention slots arranged at angular intervals about and substantially perpendicular to the axis of rotation of said plate, said plate having guides configured similarly to the object being processed and extending substantially parallel to the axis of rotation of said carrier to align said object in said carrier, the surface of said plate being configured similiarly to the face of said object to orient said object on said plate;

object retention means slidably arranged in said slots to slide substantially parallel to the plane of said support plate and including tensioning pads extending substantially parallel to the axis of rotation of said carrier;



biasing means arranged between said support plate and said retention means to bias said retention means away from the axis of rotation of said guide plate; and

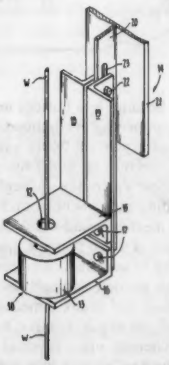
tension means for applying a constant predetermined force to said tensioning pads to urge said retention means against said biasing means toward the axis of rotation of said guide plate so that said retention means retain an object during rotation of said carrier and centrifugal force acts against said tensioning means.

4,317,428

APPARATUS FOR CONTROLLING METAL COATINGS ON WIRE, STRIP AND THE LIKE EMERGING FROM METAL BATHS

Anthony J. Sander, Bonbeach; Jack P. Sciffer, New Lambton, and Richard W. Whitton, Cardiff, all of Australia, assignors to Australian Wire Industries Proprietary Limited, Victoria, Australia

Division of Ser. No. 962,939, Nov. 22, 1978. This application Apr. 16, 1980, Ser. No. 140,801
Claims priority, application Australia, Dec. 15, 1977, PD 2788; May 25, 1978, PD 4509
Int. Cl.³ B05B *5/02*
U.S. Cl. 118—623 **21 Claims**



1. An apparatus for controlling metal coatings on wire, strip, mesh or the like, comprising a molten metal bath from which the wire, strip, mesh or the like emerges substantially vertically, an electromagnetic device at least partially immersed in the bath, said electromagnetic device providing an alternating

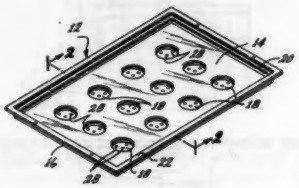
electromagnetic field generated by single phase alternating electric current, and the positioning being such that the electromagnetic field is applied at or below the point of emergence and such that the point of emergence is always within the electromagnetic field.

4,317,429

REUSABLE PLASTIC REARING PANEL APPLICABLE TO AQUACULTURE

David L. Leighton, San Diego, and Charles F. Phleger, Solana Beach, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Nov. 30, 1979, Ser. No. 98,882
Int. Cl.³ A01K *61/00*
U.S. Cl. 119—2 **4 Claims**



1. Apparatus for rearing shellfish comprising:

a plurality of panels, each one of said plurality of panels defining at least one recess therein for containment of a maturing shellfish, said panel defining at least one hole within said recess for providing relief for cementation thereto by a shellfish; and

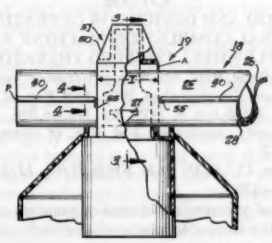
mesh means disposed over said at least one recess of each one of said plurality of panels for containment of a shellfish therein while affording access to waterborne sources of nutrition for ingestion by said shellfish within said at least one recess, said plurality of said panels being joined together end to end by lines connectable to means for submerging and suspending said plurality of panels in an aquatic environment.

4,317,430

AUGER CONVEYOR TUBE

Ray E. Swartzendruber, Syracuse, Ind., assignor to Chore-Time Equipment, Inc., Milford, Ind.

Filed Sep. 2, 1980, Ser. No. 183,062
Int. Cl.³ A01K *5/00*
U.S. Cl. 119—52 AF **5 Claims**



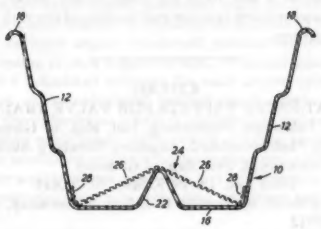
1. A tube structure for use in an auger conveyor, the tube structure having at least two adjacent stationary tube sections, each tube section comprising, in combination, a bi-edged tube sheet curved in a mediate portion to form a tube of substantially circular cross-sectional aspect, a portion adjacent a first sheet edge extending substantially radially outwardly to form a male flange, and a portion adjacent a second sheet edge having a first element extending substantially radially outwardly, that portion being reversely turned to provide a second element extending radially inwardly, the first and second elements thus forming a female flange into which the male flange fits, to thereby form a seam and maintain the tube sheet in its cross-sectional aspect, the male flange element being provided with a tab element spaced apart from the circular tube sheet mediate portion and extending in a generally perpendicular direction from the male flange element to provide a bearing surface for flange tab/feed receiving means interengagement, the seam being axially interrupted over at least one portion of the tube section to accommodate the connection of feed receiving means to the tube section, the tube sheet defining a feed drop-out aperture located axially within the tube seam interrupted portion but being angularly spaced therefrom to discourage the collection and retention of feed at the tube seam, one tube section having an end bell portion of expanded inner diameter to receive an unexpanded diameter spigot end portion of the adjacent tube section, the bell portion including a plurality of slots, the tube section structure further including identifier means permanently applied to at least one tube section for identifying the bell slot into which an adjacent tube section spigot seam should be inserted to provide an interconnected tube array of progressively angularly offset tube sections.

4,317,431

ANIMAL FOOTBATH

Clifford S. J. Sparkes, Landshire Farm, Chilton Polden, Bridgwater, Somerset, TA7 9DS, England

Filed Jul. 7, 1980, Ser. No. 166,365
Int. Cl.³ A01K *29/00*
U.S. Cl. 119—158 **8 Claims**



1. An animal footbath for cloven-hoofed animals comprising: an elongate open-topped liquid container for the animals to walk through, said liquid container having a perforate floor of a relatively coarse mesh to allow detritus from the animals' hooves to pass therethrough, said perforate floor being relatively immovably fixed in said liquid container and raised above the base of said container so as to allow a space below said perforate floor for bath liquid and accumulated detritus, said perforate floor further having a transverse cross section which slopes downwards from a central region so that the animals' feet bear on the sloping surfaces on either side of the central region as the animals pass along the footbath.

4,317,432

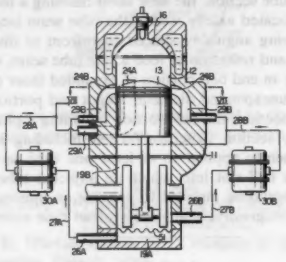
TWO-CYCLE INTERNAL COMBUSTION ENGINE

Masaaki Noguchi, Nagoya; Yukiyasu Tanaka, Okazaki, and Taro Tanaka, Chiryu, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Continuation of Ser. No. 947,159, Sep. 28, 1978, abandoned. This application Sep. 12, 1980, Ser. No. 186,598
Claims priority, application Japan, Oct. 10, 1977, 52-121328
Int. Cl.³ F02B *15/00, 17/00*
U.S. Cl. 123—1 R **7 Claims**

1. A method for operating a two-cycle internal combustion engine with a single or sole combustion chamber of the type in which the air-fuel mixture is charged into a cylinder in the

scavenging stroke and compressed in the compression stroke, said method comprising charging, during the downward movement of the piston, the rich air-fuel mixture in the state of a gentle stream into the cylinder immediately above a piston in the scavenging stroke; thereafter charging the lean air-fuel mixture in the state of a gentle stream into the cylinder immediately above the piston, thereby forming strata of the residual gases, the rich air-fuel mixture and the lean air-fuel mixture in the cylinder from a portion remote from the piston in the order



named and in contact with each other; while preventing further fuel charging during upward movement of the piston chemically activating part of the rich air-fuel mixture by the heat contained in the residual gases, thereby producing radicals; and compressing the rich air-fuel mixture containing said radicals and the lean air-fuel mixture to the compression ratio between about 4 and 10 in the compression stroke, thereby effecting compression ignition and burning of the rich and lean air-fuel mixtures.

4,317,433

FLAT-FACED TAPPETS FOR VALVE TRAINS

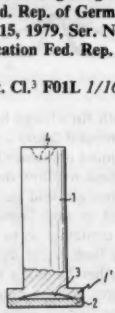
Wolfgang Fuhrmann, Nuremberg, Fed. Rep. of Germany, assignor to Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft, Nuremberg, Fed. Rep. of Germany

Filed Aug. 15, 1979, Ser. No. 66,614

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1978, 2835912

Int. Cl.³ F01L *1/16*

U.S. Cl. 123—90.51 **9 Claims**



1. A flat-faced tappet, especially for valve trains in reciprocating internal combustion engines, said tappet comprising in combination:

a shaft having a first upper end that cooperates with valve components belonging therewith, and a second lower end remote from said first end; and

a cam follower member of highly elastic material operatively connectible to said shaft at said second end thereof, a hollow space being provided only between said cam follower member and said second lower end of said shaft for allowing deflection of said cam follower member, the highly elastic material of said cam follower member at least at that portion which is contactable directly by a cam belonging therewith being made of a highly elastic tool steel.

4,317,434

PREHEATING APPARATUS FOR DIESEL ENGINES

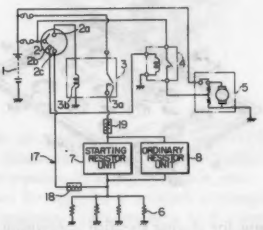
Yoji Kato, Okazaki, Japan, assignor to Nippon Soken, Inc., Nishio, Japan

Filed Oct. 9, 1980, Ser. No. 195,504

Claims priority, application Japan, Oct. 11, 1979, 54-131656; Dec. 28, 1979, 54-172455; Dec. 28, 1979, 54-172456

Int. Cl.³ F02B *9/08;* **F02M** *17/00*

U.S. Cl. 123—145 A **4 Claims**



1. A preheating apparatus for Diesel engines comprising:

a glow plug disposed in a cylinder-head of an engine;

starting resistor means connected between a voltage source and said glow plug, said starting resistor means including a resistance body principally composed of barium titanate to exhibit a resistance characteristic of a positive resistance temperature coefficient and abruptly increasing its resistance value at a predetermined temperature; and

ordinary resistor means connected in parallel with said starting resistor means;

said starting resistor means showing a resistance value smaller than that of said ordinary resistor means when a temperature of said glow plug is relatively low, and said starting resistor means showing a resistance value larger than that of said ordinary resistor means when the temperature of said glow plug is relatively high.

4,317,435

METHOD AND DEVICE FOR OPERATING AN INTERNAL-COMBUSTION MACHINE WITH A FLYWHEEL COUPLED THERETO

Ernst H. Kohlhage, Bühl, Fed. Rep. of Germany, assignor to Luk Lamellen und Kupplungsbau, Bühl, Fed. Rep. of Germany

Filed Jun. 6, 1979, Ser. No. 46,056

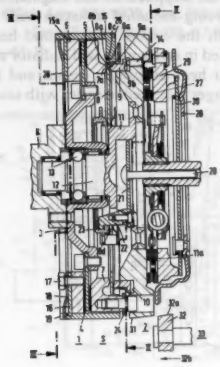
Claims priority, application Fed. Rep. of Germany, Jun. 6, 1978, 2824682

Int. Cl.³ F02N *5/04;* **F16D** *21/06, 13/44*

U.S. Cl. 123—179 J **22 Claims**

1. Method of operating an internal-combustion engine which is automatically stoppable in accordance with specific conditions, such as when no driving power is required, and startable by a flywheel disposed concentrically to the crankshaft of the internal-combustion engine for compensating for an extent of nonuniformity in the rotation thereof, said flywheel being automatically disengageable from the internal-combustion engine by a clutch and automatically re-engageable thereby when power is required, which comprises automatically bringing a friction wheel of a starter motor into engagement with the flywheel, when the flywheel is uncoupled from the internal-combustion engine, so as to accelerate the flywheel to a

predetermined speed for starting up the internal-combustion engine, and thereafter engaging the clutch, the flywheel remaining engaged with the internal-combustion engine while the engine delivers power.

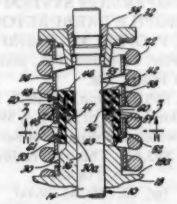


4,317,436

VALVE STEM SEAL

David E. Barnhart, Pontiac, and Douglas R. Gates, Rochester, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 8, 1979, Ser. No. 92,271
Int. Cl.³ F01L *3/08*
U.S. Cl. 123—188 P **5 Claims**



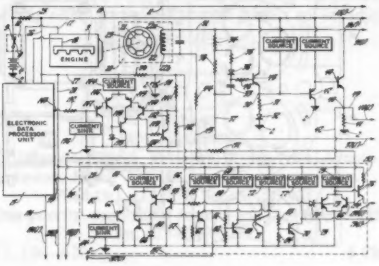
3. A valve stem seal for the axially reciprocable stem of a poppet valve that is slidably guided in a cylindrical valve guide bushing of an internal combustion engine, said valve stem seal including a tubular outer portion having axial first and second ends; a tubular inner portion having axial first and second ends; a radial web interconnecting said outer portion and said inner portion at their respective said second ends with said outer portion and said inner portion thus depending from said radial web in concentric relationship and with said outer portion loosely encircling said inner portion; said outer portion being of an axial extent to permit a portion thereof adjacent to its said first end to be tightly engaged around the valve guide bushing; said inner portion being of lesser axial extent than and extending within said outer tubular portion, said inner portion having a stepped bore therethrough providing a first cylindrical internal wall adjacent to said web of a diameter greater than the outside diameter of the stem of the poppet valve and a second internal wall at the opposite end of said inner portion from said web, the diameter of said second internal wall conforming to the outside diameter of the stem of the poppet valve and defining an annular projecting sealing lip extending radially inward for sealingly engaging around the valve stem; and, a circular clamp means encircling said outer portion closely adjacent to said first end to bias said outer portion into sealing engagement with the valve guide bushings, said flange web being of a thickness relative to the wall thickness of said outer portion and said inner portion so as to permit pivotal movement of said inner portion relative to said outer portion to compensate for any relatively small run out of the reciprocating axis of the poppet valve relative to the outer peripheral surface of the valve guide bushing.

4,317,437

INTERNAL COMBUSTION ENGINE IGNITION SYSTEM

Timothy F. Lindgren, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 10, 1979, Ser. No. 101,762
Int. Cl.³ F02P *5/08*
U.S. Cl. 123—414 **5 Claims**



1. An internal combustion engine ignition system for controlling the ignition spark event of each cylinder of an associated internal combustion engine comprising in combination with an electronic data processor unit adapted to calculate an ignition spark event engine crankshaft angle for each cylinder of the associated engine, to produce subsequent to the occurrence of an input engine crankshaft position reference signal corresponding to each engine cylinder an output ignition dwell signal of a calculated duration for each engine cylinder that terminates at the calculated ignition spark event crankshaft angle of the cylinder to which it corresponds and to produce an operating mode select output signal of a first potential level while the associated engine is being cranked and while the data processor unit is inoperative due to a malfunction and of a second potential level while the data processor unit is operative:

means for producing a series of alternating current timing signals in timed relationship with said associated engine that are so phased relative to engine crankshaft angle that a selected polarity transition of each cycle thereof occurs at a preselected constant engine crankshaft angle relative to piston top dead center;

means responsive to said alternating current timing signals for producing an engine crankshaft position reference signal for each cylinder of said associated engine at a preselected constant engine crankshaft angle relative to piston top dead center that is supplied as an input signal to said data processor unit;

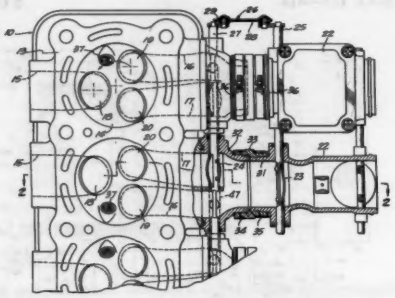
an electronic control unit including engine speed ignition spark advance circuitry capable of being responsive to said alternating current timing signals for effecting an ignition spark event for each cylinder of said associated engine at the ignition spark event crankshaft angle as determined by engine speed; and

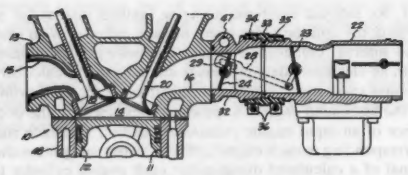
switching circuitry responsive to said data processor unit operating mode select output signal of said first potential level for effecting an ignition spark event for each cylinder of said associated engine through the operation of said electronic control unit in response to said alternating current timing signals and to said data processor unit operating mode select output signal of said second potential level for effecting an ignition spark event for each cylinder of said associated engine in response to the termination of each of said data processor unit output ignition dwell signals.

4,317,438
HIGH POWER OUTPUT ENGINE

Shizuo Yagi, Asaka; Junji Otani, Omiya; Yasuo Ikenoya, Kawagoe, and Hiroshi Kogure, Tokorozawa, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 2, 1979, Ser. No. 81,152
Claims priority, application Japan, Oct. 6, 1978, 53-123341
Int. Cl.³ F02M *13/06*
U.S. Cl. 123—432 **14 Claims**





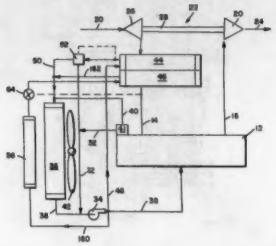
1. In a high power output internal combustion engine having a piston mounted to reciprocate in a cylinder, the improvement comprising, in combination: a cylinder head cooperating with said cylinder and piston to form a combustion chamber, said combustion chamber having first and second intake ports and at least one exhaust port, a first intake valve for controlling flow through the first intake port, a second intake valve for controlling flow through the second intake port, an exhaust valve controlling flow through the exhaust port, said valves all being mounted in said cylinder head, said intake valves being positioned on one side of said combustion chamber and said exhaust valve being positioned on the other side, a spark plug communicating with said combustion chamber and positioned on the side with the exhaust valve and near said first intake valve, means for supplying air-fuel mixture to each of said intake ports, said means including a first throttle valve operated by an acceleration pedal and located upstream of both intake ports, a second throttle valve located downstream of said first throttle valve to control flow through said second intake port, whereby to define the quantity of air-fuel mixture flowing through said second intake port at a lower rate than that flowing through said first intake port, and means coordinating movement of said first and second throttle valves.

4,317,439
COOLING SYSTEM

Robert C. Emmerling, Manhattan Beach, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Division of Ser. No. 69,437, Aug. 24, 1979, abandoned. This application Nov. 24, 1980, Ser. No. 209,630
Int. Cl.³ F02B *29/04*
U.S. Cl. 123—563 **12 Claims**

1. A cooling system for a charge air combustion engine, comprising a radiator mounted in series with the engine for circulation of a liquid coolant through said radiator and the engine for controlling the operating temperature of the engine; first and second charge air heat exchanger means for serial passage of charge air supplied to the engine, said first heat exchanger means being mounted in series with said radiator and in parallel with the engine, said second heat exchanger means being mounted in series with said radiator and in parallel with both said first heat exchanger means and the engine; a cooling heat exchanger mounted in series with said second heat

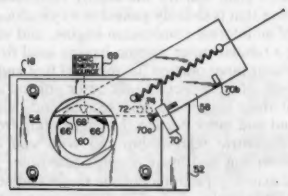


exchanger means and in parallel with said first heat exchanger means and the engine for reducing the temperature of liquid coolant circulated to said second heat exchanger means; and means for circulating a liquid coolant in parallel through the engine and through said first heat exchanger means for first stage cooling of the charge air and through said cooling heat exchanger and said second heat exchanger means for further and second stage cooling of the charge air.

4,317,440
SINGLE POINT DISPERSION SYSTEM HAVING A LOW PROFILE CARBURETOR

Arthur K. Thatcher, P. O. Box 352, Merritt Island, Fla. 32952, and Ed R. McCarter, Maitland, Fla., assignors to Arthur K. Thatcher, Merritt Island, Fla.

Division of Ser. No. 868,825, Jan. 12, 1978, Pat. No. 4,231,333, which is a continuation-in-part of Ser. No. 593,001, Jul. 3, 1975, Pat. No. 4,100,896, which is a division of Ser. No. 293,377, Sep. 29, 1972, Pat. No. 3,893,434. This application Feb. 4, 1980, Ser. No. 118,451
Int. Cl.³ F02M *29/00*
U.S. Cl. 123—590 **17 Claims**



1. Fuel-air mixing apparatus for an internal combustion engine having an intake manifold and a throttle control for controlling the engine, comprising

(a) passage means for forming an airstream passage for directing an airstream into said intake manifold;

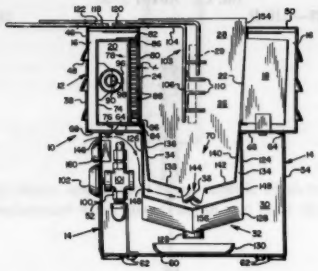
(b) fuel injection means for injecting fuel toward a dispersion point located within said airstream passage at which the fuel may be dispersed; and

(c) airstream control means for displacing the airstream within said passage to increase the distance between said dispersion point and said airstream when the throttle control is adjusted so as to produce less engine speed and for permitting a decrease in the distance between said dispersion point and the airstream when the throttle control is adjusted so as to increase engine speed.

4,317,441
BROILER APPARATUS

Roger M. Berg, 5845 SW. 190th, Aloha, Oreg. 97005

Filed Aug. 17, 1979, Ser. No. 67,368
Int. Cl.[3] A47J *37/00, 37/04*
U.S. Cl. 126—41 R 12 Claims

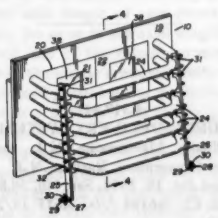


1. A broiler for cooking a slab of meat comprising:
housing means defining an interior chamber;
first and second heating members positioned within the interior chamber, each such heating member having an upright heat generating surface which faces the heat generating surface of the other heating member, the heat generating surface of the first heating member being spaced from the heat generating surface of the second heating member a distance which is substantially greater than the width of the slab of meat so as to define a cooking zone therebetween;
said housing means having an upper wall which substantially closes the top of the housing except through a mouth defined by the upper wall above said cooking zone, the mouth being positioned such that a generally vertical slab of meat inserted downwardly through the mouth and into the cooking zone is cooked and a slab of meat suspended above said mouth in a warming zone is warmed by upwardly passing heat from the cooking zone;
said housing means including a stop member; and
slap support means for suspending a slab of meat generally vertically within the cooking zone when in a first position and for suspending the slab of meat above the mouth when in a second position, said slab support means including a handle portion positioned so as to abut said stop member when the slab of meat is centered between said heating members to thereby provide an indication that the slab of meat is centered within the cooking zone.

4,317,442
FIREPLACE HEATING UNIT

John R. Doyle, 234 Edna St., Poland, Ohio 44514

Filed May 5, 1980, Ser. No. 146,650
Int. Cl.[3] F24B *7/00*
U.S. Cl. 126—121 4 Claims

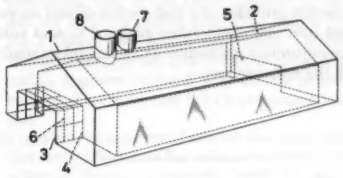


1. An improvement in a heater for use in a fireplace having rear and side walls and an open front, the improvement comprising a plurality of horizontally positioned generally U-shaped heat exchange tubes with open ends arranged in vertically spaced relation to one another, means for supporting and spacing said tubes in the fireplace adjacent said rear and side walls so that heat from a fire in the fireplace will heat the tubes and air within them, means for circulating air through said tubes, a wide frame having openings therein with which the ends of the tubes communicate positioned across the open front of the fireplace, a pair of doors on said wide frame for closing the area defined by said frame, said air circulating means being in communication with one of said open ends of each of said heat exchange tubes, a portion of each of said heat exchange tubes being offset horizontally with respect to an adjacent tube.

4,317,443
SOLAR HOUSE

Masaru Hayama, 1296-5, Takimiya, Ryonan-cho, Ayauta-gun, Kagawa-ken, Japan

Filed Oct. 11, 1979, Ser. No. 83,931
Claims priority, application Japan, Oct. 11, 1978, 53-125591
Int. Cl.[3] F24J *3/02*
U.S. Cl. 126—429 4 Claims



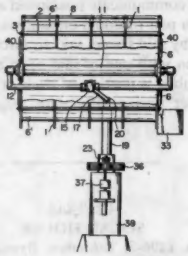
1. A solar house comprising:
an outer wall having a first opening in a lower portion of a side thereof communicating with the ambient;
an inner wall spaced inwardly from said outer wall and having at least a second and third opening, said second opening being located in a lower portion of a side of said inner wall and being substantially axially aligned with said first opening, said third opening being located in a lower portion of a side of said inner wall opposite said second opening
an outer chamber being defined by a space between said outer and inner wall and extending to said first and second openings;
an inner chamber being defined by a space inside the inner periphery of said inner wall;
a removable plate means removably disposed within said outer chamber for defining a passageway communicating with said first and second openings and for closing and opening direct communication between said first opening and said outer chamber in first and second phases of operation of said house, respectively
a first vent means in an upper location of said outer wall for communicating said outer chamber with the ambient in said first phase of operation of said house; first removable closure means for closing said first vent means in a second phase of operation of said house;
a second vent means for communicating said inner chamber with the ambient second removable closure means for closing said second vent means in said first phase of operation of said house; and third removable closure means for closing said second opening in the second phase of operation of said house.

4,317,444

SOLAR HEAT UTILIZATION APPARATUS

Saburo Maruko, 430-3 Kamiwada, Yamato-Shi, Kanagawa-Ken, Japan

Filed Feb. 8, 1980, Ser. No. 119,882
Claims priority, application Japan, Feb. 27, 1979, 54/21440
Int. Cl.[3] F24J 3/02
U.S. Cl. 126—438 8 Claims



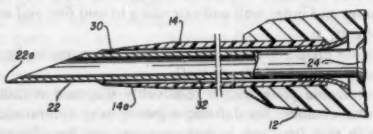
1. In a solar heat utilization apparatus comprising a sunray reflector arcuately movable about an axis and a heat collecting means provided at the focus of said reflector, characterized by the fact that a liquid recycle pipe is provided along said heat collecting means and includes a cold liquid discharge preventing mechanism provided in a mid-section of said recycle pipe, and liquid inlet and outlet tubes attached to said cold liquid discharge prevention mechanism extending substantially coaxially with the reflector axis.

4,317,445

CATHETER INSERTION UNIT WITH SEPARATE FLASHBACK INDICATION FOR THE CANNULA

Thomas P. Robinson, Plano, Tex., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Mar. 31, 1980, Ser. No. 136,082
Int. Cl.[3] A61M 5/00, 25/00
U.S. Cl. 128—214.4 11 Claims



1. In an intravenous unit of the type having a catheter secured at its proximal end to a hub, and a removable piercing needle extending through the hub and catheter with the tip of the needle protruding beyond the distal end of the catheter, the improvement which comprises:

said catheter having internal and external surfaces;

said catheter including a side port therein located adjacent to the distal end of said catheter; and

the internal surface of said catheter around the side port being configured to define a predetermined flashback chamber between said catheter and needle and extending from the side port to the hub for providing a visual indication of venous entry of said catheter.

4,317,446

PREFILLED DISPOSABLE SYRINGE

Thomas J. Ambrosio, Somerville; Henry J. Buchman, Edison; Joseph J. Rogus, Bridgewater, and Henry R. Sochon, Clifton, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Sep. 4, 1980, Ser. No. 183,916
Int. Cl.[3] A61M 5/00
U.S. Cl. 128—218 R 16 Claims

1. A prefilled disposable syringe comprising:

(a) an assembly comprising a hub, a needle rigidly attached to said hub, and a barrel having a hollow bore, said hollow bore in fluid communication with said needle, said barrel having an outer surface near said hub,

(b) a stopper disposed in said bore having first engagement means,

(c) medicament disposed in said bore between said stopper and said needle, and

(d) a plunger rod/protector adapted to enclose said needle, hub and outer surface comprising a narrow portion having a cavity for said needle, said narrow portion capable of fitting within said hollow bore; attachment means for attaching said plunger rod/protector to said outer surface at a first end of said narrow portion comprising an inner surface adapted to enclose said outer surface and flexible means protruding from said inner surface to grip said outer surface; and a second engagement means at a second end of said narrow portion adpated to engage said first engagement means, wherein said plunger rod/protector is adapted to securely protect said needle during transit and storage and to act as a plunger rod after engagement of said firsrt and second engagement means.

4,317,447

DRUG DELIVERY SYSTEM

Bernard L. Williams, Martinsville, N.J., assignor to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Jul. 19, 1979, Ser. No. 58,881
Int. Cl.[3] A61M 7/00; A61F 13/20
U.S. Cl. 128—260 17 Claims

1. A device for delivering a medicament to the vaginal cavity consisting of a molded polymeric sheath having at least

one open end, said sheath consisting of an intimate mixture of a polymeric material and a medicament and being dissolvable

in body fluids, said device being capable of slowly releasing said medicament while dissolving in said body fluids.

4,317,448

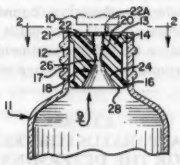
SYRINGE-TYPE LIQUID CONTAINER DISPENSER ADAPTER

Philip E. Smith, Chicago, Ill., assignor to Baxa Corporation, Northbrook, Ill.

Division of Ser. No. 931,712, Aug. 8, 1978, Pat. No. 4,230,112. This application Mar. 14, 1980, Ser. No. 130,327

Int. Cl.³ A61J *1/00*

U.S. Cl. 128—272.3 **6 Claims**



1. An adapter for connecting in fluid communication a nozzle of a liquid medication dispensing syringe with the interior of a bottle containing liquid medication, comprising:

a tubular body member composed of resilient material and being generally cylindrical in shape to fit snugly within the mouth of the bottle;

means defining an opening extending axially through said body member for receiving the nozzle of the syringe, said opening being generally of an hourglass configuration and including a forward nozzle receiving portion and a rear portion, the axial length of said forward portion being substantially the same as the axial length of the nozzle so that the exit end of the nozzle terminates at said rear portion when the nozzle is inserted fully within said opening, said forward portion being generally conical in shape throughout its axial length and having generally the same axial length as the axial length of said rear portion; and

means defining a fluid pathway disposed at said rear portion of said opening for guiding liquid to said forward nozzle receiving portion and for preventing or minimizing the introduction of air into said opening;

wherein said rear portion of said opening is conically shaped and is substantially larger in size than said forward portion.

4,317,449

DISPOSABLE ADULT INCONTINENT BRIEF

John C. Nowakoski, Greenwood, S.C., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Jan. 28, 1980, Ser. No. 116,176

Int. Cl.³ A41B *13/02*; A61F *13/16*

U.S. Cl. 128—287 **4 Claims**

1. A disposable adult incontinent brief of box-pleated design comprising:

(a) a moisture-impervious backing sheet;

(b) a facing sheet substantially co-extensive with backing sheet;

(c) a filler interposed between said facing sheet and said backing sheet;

(d) a plurality of fastening means, each of said fastening means comprising:

(i) a tab member at least approximately 5½" in length having adhesive on one side, said tab being folded into a substantially Z-shape, the bottom portion of said tab being affixed to said brief by said adhesive; and

(ii) a detachable release liner interposed between the adhesive-coated side of the upper segment of the Z-shape and the adhesive-coated side of the middle segment of the Z-shape, said release liner being adapted for removal so as to permit attachment of the said upper and middle segments of the Z to a selected position on the backing sheet when said brief is positioned on a subject; and

(iii) said bottom segment of said tab having an upward fold that forms a flap, said flap being positioned such that the adhesive thereon releaseably holds the non-adhesive coated side of said middle segment of the Z-shape prior to unfolding said tab.

4,317,450

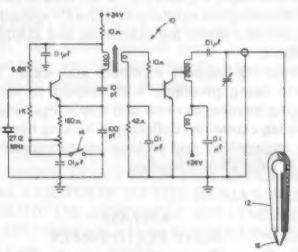
METHOD OF EPILATION

Edward Chalmers, 31 Benjamin Rd., Arlington, Mass. 02174, and William H. Huggins, 26 Heritage Cir., Clinton, Conn. 06413

Filed May 29, 1979, Ser. No. 42,799

Int. Cl.³ A61B *17/41*

U.S. Cl. 128—303.13 **16 Claims**



1. A method of removing a hair from a living being comprising the steps of:

selecting an ionic, wetting solution for the hair and surrounding skin,

said solution selected to be nontoxic, having ions in quantities sufficient, in a thin film, to conduct an electrical current of sufficient strength to coagulate a hair papilla and having wetting properties sufficient to wet the

external hair and the hair within the follicle to form a continuous thin film of solution therealong to thereby establish an ion path from a voltage-applying region on the hair above the skin to a region within the follicle, through which path electrical current can flow,

applying said solution to the hair and surrounding skin,

allowing sufficient time to pass to permit said solution to form said continuous film, and

applying a regulated electric voltage to said hair at said region thereby to cause electric current to flow from said region down said film to the hair papilla and thence to the interior body of the living being,

said electric voltage being regulated in respect of said liquid to establish a current sufficient to coagulate said hair papilla, and thereafter removing said hair.

4,317,451

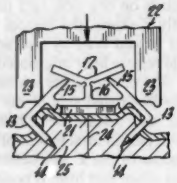
PLASTIC SURGICAL STAPLE

Robert J. Cerwin, Pittstown, and William P. McVay, Somerville, both of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Feb. 19, 1980, Ser. No. 122,557

Int. Cl.³ A61B *17/12, 17/08;* **F16B** *15/00;* **A31B** *1/00*

U.S. Cl. 128—325 **26 Claims**



1. A one-piece, self-locking, plastic surgical staple comprising, in a vertical plane,

a horizontal bridging member spanning the width of the staple and terminating at each end in an upward extending staple leg support member,

an L-shaped staple leg extending horizontally outward and downward from each leg support member and terminating in a tissue-piercing point,

a staple leg extension extending inwardly from each staple leg at the leg support member and terminating with a space between opposing ends of said extensions,

a center post extending vertically upward from said bridging member and through said space between the opposing ends of said extensions, and

a horizontal staple leg locking bar secured to said center post and extending horizontally in a closely spaced relationship adjacent said staple leg extensions and staple leg support members,

said staple leg support members and staple legs secured thereto being pivotable with respect to said horizontal bridging member to close said staple legs, whereupon said staple leg extensions deflect said locking bar and are thereafter engaged by said locking bar to maintain said staple legs in their closed position.

4,317,452

BODY FLUID DRAIN

Ronald D. Russo, Barrington; Francis E. Blinkhorn, North Kingstown, and Len L. Curado, East Greenwich, all of R.I., assignors to C. R. Bard, Inc., Murray Hill, N.J.

Filed Feb. 4, 1980, Ser. No. 118,550

Int. Cl.³ A61M *1/00*

U.S. Cl. 128—350 R **9 Claims**

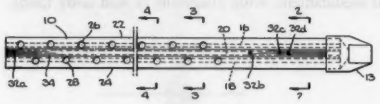
1. A substantially flat drain for use in draining body fluids from a surgically created drainage site in the body comprising:

a longitudinal flexible rubber tube having first and second opposite, mutually parallel, substantially flat walls spaced apart by a distance subtantially less than the width of the flat walls and joined along their adjacent lateral edges;

a plurality of holes through each of the flat walls of the tube for admitting body fluids from the drainage site into the tube for conveying from the drainage site via the tube;

first and second laterally spaced, mutually parallel, longitudinal flexible rubber ribs extending parallel to the longitudinal axis of the tube on the inside of the first flat wall and projecting into the interior of the tube, the width of each of the first and second ribs measured perpendicular to the longitudinal axis of the tube and parallel to the flat walls being at least as great as the projection of the rib from the first flat wall; and

a third longitudinal flexible rubber rib extending parallel to the longitudinal axis of the tube on the inside of the second flat wall and projecting into the interior of the tube inter-



mediate the first and second ribs, the width of the third rib measured perpendicular to the longitudinal axis of the tube and parallel to the flat walls being at least as great as the projection of the third rib from the second flat wall, the first and second ribs being laterally spaced by a distance greater than the width of the third rib and the third rib projecting at least partially into the space between the first and second ribs even when the tube is unstressed, the ribs preventing the flat walls from contacting one another and occluding the tube when the tube is subjected to compression forces perpendicular to the flat walls, and the ribs cooperating with one another and with the walls of the tube to break up any obstructions which may tend to form in the tube by subjecting the material in the tube to transverse forces when the flat walls of the tube are subjected to relative lateral displacements by movements of the body surrounding the drainage site.

4,317,453

METHOD AND APPARATUS FOR TESTING A PERSON'S BREATH FOR THE DETERMINATION OF ITS ALCOHOL CONTENT

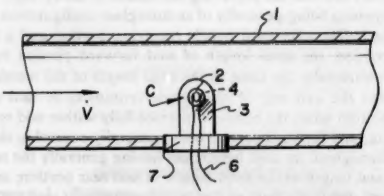
Ulrich Heim, Reinfeld, and Hans-Friedhelm Kempin, Munich, both of Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 11, 1980, Ser. No. 120,548

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1979, 2906876

Int. Cl.³ A61B *10/00*

U.S. Cl. 128—719 **8 Claims**



5. A device for determining an instant of time for testing a person's breath for its alcohol content, comprising, a tube through which the person's breath is directed, a thermal capacitor having known thermal capacity in said tube including means for heating said capacitor to a predetermined initial

temperature, means for sensing the temperature of said capacitor, said capacitor being adapted to be cooled by a person's breath passing through the tube, comparator means for determining the instant of time when said capacitor is cooled by a predetermined amount, means defining a test chamber connected to said tube, and value means controlled by said comparator means for directing the breathing air from said tube to said test chamber for testing therein after said instant, and control means for stopping said heating means when breath first passes said thermal capacitor.

4,317,454

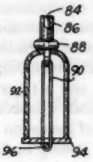
METHODS AND DEVICES FOR OBTAINING SPECIMENS AND FOR SIGNALLING WHEN THE SPECIMEN HAS BEEN COLLECTED

Louis Bucalo, 155 Roberts St., Holbrook, N.Y. 11741

Continuation of Ser. No. 821,749, Aug. 4, 1977, abandoned. This application Jul. 1, 1980, Ser. No. 165,052

Int. Cl.³ A61B *10/00*

U.S. Cl. 128—759 **4 Claims**



1. In a method for collecting a specimen present at a part of a living being, the steps of situating at said part of the being a means which will collect the specimen and which should be removed, and at least in some cases replaced, at a time when said means has collected the specimen to a given extent, and signalling the living being or an observer of the living being by a sensation which is readily perceived when said means have collected the specimen to said given extent and wherein the sensation is created by impacting a pair of elements against each other which impact is capable of being readily perceived.

4,317,455

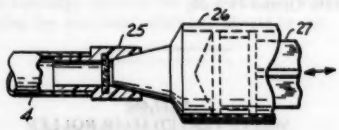
METHOD OF COLLECTING AND DISPENSING A BLOOD SAMPLE

David S. Akhavi, Los Angeles, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Division of Ser. No. 25,979, Apr. 2, 1979, Pat. No. 4,266,558. This application Dec. 29, 1980, Ser. No. 220,572

Int. Cl.³ A61B *5/14*

U.S. Cl. 128—765 **6 Claims**



1. A method of collecting a blood sample comprising the steps of:

(a) puncturing a blood conduit with a needle attached to a vented reservoir containing a gas;

(b) applying a suction to the vent of the reservoir to extract blood into the reservoir; and

(c) closing the reservoir at a location to segment the collected blood sample.

4,317,456

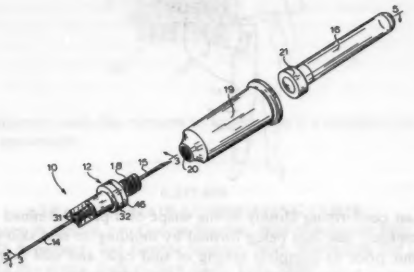
MULTIPLE SAMPLE NEEDLE WITH ANTI-BACKFLOW VALVE

Edward P. Percarpio, North Haledon, N.J., assignor to Becton, Dickinson and Company, Paramus, N.J.

Filed Mar. 10, 1980, Ser. No. 129,149

Int. Cl.³ A61B *5/14*

U.S. Cl. 128—766 **18 Claims**



1. A valved multiple sample needle assembly for use with an evacuated container in obtaining blood samples from a patient comprising:

a housing having a forward end, a rearward end and a chamber within;

a first access opening through the forward end of said housing in fluid communication with said chamber;

a cannula extending outwardly from said first access opening in fluid communication with said chamber and being adapted for insertion into a patient;

a second access opening through the rearward end of said housing in fluid communication with said chamber; and

a resilient, collapsible valve member positioned in said chamber and normally contacting said first access opening in a fluid-sealing arrangement therewith when the pressure at said second opening is substantially equal to or positive with respect to the first access opening to serve as a closed valve, said valve member adapted to resiliently collapse and operatively move away from said sealing engagement with said first access opening when the pressure at said second opening is sufficiently negative with respect to the pressure at said first opening to serve as an open valve thereby allowing fluid to flow from said first access opening into said chamber and out of said second access opening, said chamber including a rearward wall having a transverse groove therein communicating with said second opening, said groove being longer than the greatest transverse length of said valve member so that fluid can flow into said groove when said valve member is collapsed, said valve member being positioned in said groove in both the open and closed positions thereof and adapted to be constrained therein.

4,317,457

ELECTROCONDUCTING CAST FORMING A CUTANEOUS ELECTRODE FOR APPLYING ELECTRICAL CURRENTS TO THE HUMAN BODY FOR THERAPEUTIC OR AESTHETIC TREATMENT AND METHOD OF USING SUCH ELECTROCONDUCTING CAST

Jacqueline Guillot, 13, Allée de l'Entente, 93130 Noisy-le-Sec, France

Filed Mar. 27, 1979, Ser. No. 24,370

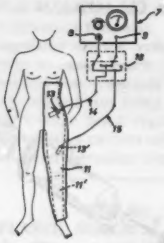
Claims priority, application France, Mar. 28, 1978, 78 08845

Int. Cl.³ A61N *1/18*

U.S. Cl. 128—783 **15 Claims**

1. A cutaneous electrode comprising a rigid electroconductive cast comprising a powder capable of setting with water, water present in an amount greater than that necessary to set

with said powder, said water containing a salt dissolved therein in a sufficient quantity to impart electrical conductivity to said rigid cast, and a metallic contact embedded within said cast and adapted to be connected to a current generator, said rigid



cast conforming closely to the shape of a predetermined skin contour, said cast being formed by molding to said skin contour prior to complete setting of said cast, and said metallic contact being embedded within said cast prior to complete setting of said cast.

4,317,458

ELECTRODE APPARATUS FOR PACING

Masayoshi Yokoyama, Tokyo, Japan, assignor to Kabushiki Kaisha Top, Tokyo, Japan

Filed Apr. 22, 1980, Ser. No. 142,846

Claims priority, application Japan, Apr. 26, 1979, 54/56835[U]

Int. Cl.³ A61N *1/04*

U.S. Cl. 128—784 **1 Claim**

1. An apparatus for cardiac pacing comprising: a hollow needle for making a piercing hole in the chest wall of a person; a plastic tubular sheath covering the needle with the exception of a sharp-pointed portion of the needle; said plastic tubular sheath being slidable and removable in relation to said needle; and an elastic electrode needle wire insertable into said sheath adapted for piercing the heart of the person through a hollow opening of said sheath after said needle is pulled out subsequently to piercing the chest wall by said needle together with said sheath; said sheath being formed at its forward end portion into a taper; said electrode needle wire having an insulation coating applied at its greater part, with the exception of a forward end portion and a rearward end portion thereof; said electrode needle wire having upper and lower criterion marks; said lower criterion mark being spaced from the top of said electrode needle wire by a length equal to the length of said sheath, said criterion marks being spaced from each other by a distance equal to the length of a forward end portion of said electrode needle wire.

4,317,459

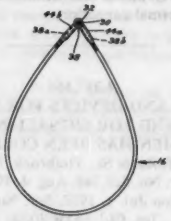
FIXATION LOOP FOR TRANSVENOUS LEADS

Byron L. Gilman, Maple Grove, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Continuation of Ser. No. 53,003, Jun. 28, 1979, abandoned. This application Sep. 25, 1980, Ser. No. 190,691

Int. Cl.³ A61N *1/04*

U.S. Cl. 128—785 **13 Claims**



1. Body implantable pacing lead for insertion through a vein of the body into a cavity of a heart comprising:

fixation loop including a longitudinal length of wound coil, a covering of insulation extending over and beyond the ends of said wound coil including an overlap at each end of said wound coil; and a transvenous lead including a wound coil, an electrode connected to a distal end of said coil and a covering of insulation over said wound coil of said lead and means joining each of said overlaps of said fixation loop to said insulation covering of said lead substantially adjacent to said electrode whereby said fixation loop positions said electrode within a cavity of the heart.

4,317,460

SMOKING PRODUCTS

Robert W. Dale, and John J. Rooney, both of Belfast, Northern Ireland, assignors to Gallaher Limited, London, England

Filed Jan. 17, 1979, Ser. No. 4,215

Claims priority, application United Kingdom, Jan. 20, 1978, 2392/78

Int. Cl.³ A24B *15/04*; A24D *1/06*

U.S. Cl. 131—334 **37 Claims**

1. A smoking product filter containing a catalyst for the low temperature oxidation of carbon monoxide to carbon dioxide, said catalyst comprising a support selected from the group comprising microporous supports having a pore diameter of less than 30 Å, zeolite and alumina, said support carrying at least one catalytically active metal, present as the metal or a metal compound, said catalyst having an activity at 20° C. of 60 to 100% after ten puffs of a test gas mixture of 3% CO, 10% CO_2, 13% O_2 and 74% N_2.

4,317,461

METAL PLATED HAIR ROLLER

George W. Anderson, 17744-1st. St. East, Redington Shores, Fla. 33708

Continuation-in-part of Ser. No. 861,946, Dec. 19, 1977. This application Nov. 17, 1980, Ser. No. 207,794

Int. Cl.³ A45D *2/00*

U.S. Cl. 132—40 **27 Claims**

1. A heaterless hair roller for curling hair by a process which comprises wrapping strands of the hair around the outer surface thereof, and exposing the wrapped strands to a separate heat source, said hair roller comprising an elongated hollow

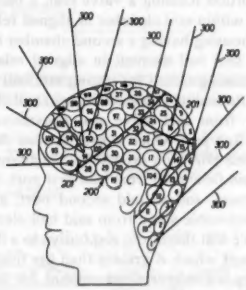
cylindrical plastic body having a metal coating on each of its surface to provide a heat conducting inner surface and a heat

radiating outer surface, and means for securing the strands around the roller.

4,317,462
AID FOR HAIRDRESSERS

Nicolas D. Steiner, London, England, assignor to Steiner Products Limited, London, Great Britain

Filed Jul. 14, 1980, Ser. No. 167,762
Claims priority, application United Kingdom, Jun. 5, 1980, 18496/80
Int. Cl.³ A45D *24/36*
U.S. Cl. 132—45 R **11 Claims**



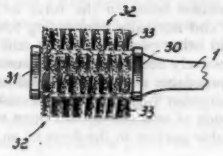
1. An aid for hairdressers comprising:
a model scalp,
a set of sheets, each for attachment along one edge to the scalp, and
means indicating the location on the scalp at which each sheet is to be attached,
wherein each sheet, when correctly attached to the scalp, has a free edge opposite the edge attached to the scalp showing the line along which hair should be cut.

4,317,463
TOOTHBRUSH STRUCTURE

Alessandro Massetti, Via Marsala, 47, San Giuliano Milanese, Milano, Italy

Filed Jul. 10, 1979, Ser. No. 56,384
Claims priority, application Italy, Jul. 13, 1978, 25658 A/78
Int. Cl.³ A45D *44/18*
U.S. Cl. 132—84 R **11 Claims**

1. A toothbrush structure comprising a handle with one end whereof a cleaning portion is associated, including swab-like elements offset with respect to each other and rotatably carried in the body of said cleaning portion, wherein according to the improvement each swab-like element has bristles projecting sidewise thereby to interfer at least in part with the bristles of

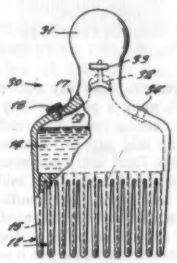


an adjacent swab-like element to transmit to it a counter-rotation movement.

4,317,464
ATRA LUBE HAIR LUBRICATING COMB

Gregory D. Bailey, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, 3615 Woolworth Bldg., 233 Broadway, both of New York, N.Y. 10007

Filed May 30, 1980, Ser. No. 154,807
Int. Cl.³ A45D *24/22*
U.S. Cl. 132—113 **3 Claims**



1. A hair lubricating comb, comprising in combination, a flat comb backbone having a row of teeth extending forwardly from a front side, a chamber inside said backbone rearward of said front side containing a hair pomade, an opening in each tooth communicating with said chamber extending to a terminal tip of each tooth for dispensing said pomade from said chamber, said chamber including means for increasing air pressure inside said chamber, said teeth and chamber having coacting means whereby flexing of said teeth controls the amount of pomade flowing into said teeth, wherein said chamber has walls integral and contiguous with said teeth.

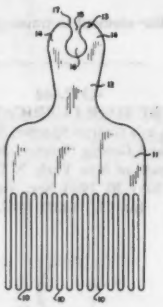
4,317,465
COMB WITH INTEGRAL CLIP FOR ATTACHING TO A SUPPORT

Thomas A. Rae, Jr., 14144 E. Seven Mile, Detroit, Mich. 48205

Continuation of Ser. No. 924,941, Jul. 17, 1978, abandoned, which is a continuation of Ser. No. 723,034, Sep. 13, 1976, abandoned. This application Dec. 29, 1980, Ser. No. 220,769
Int. Cl.³ A45D *24/00*
U.S. Cl. 132—149 **4 Claims**

1. In combination, a cylindrical support member and a comb consisting of a single piece substantially flat molding of resilient polymeric material provided with a plurality of evenly spaced straight parallel teeth of equal length integrally projecting from a trunk portion integrally terminating in an elongated handle, said handle having an extending end formed as an integral clip removably attachable to said cylindrical support member, said clip comprising an open area accepting said support member and a restricted passage leading to said open area, said restricted passage and said open area being formed

between two opposed integral portions of said handle, at least one of which is resiliently spreadable from the other for allowing said support member to be passed through said restricted passage to said open area for holding said comb in a storage position suspended from said support member, said resiliently spreadable portion being in the form of an arm having a rounded free end normally converging toward and disposed proximate said other portion forming said restricted passage with a progressively decreasing width causing resilient spreading of said spreadable portion from said other portion when said support member is passed through said restricted passage from the outside of said clip to said open area, and said resiliently spreadable portion in the form of an arm having a side



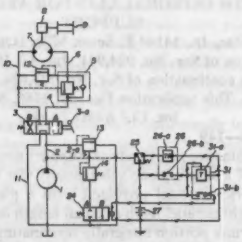
within said open area progressively converging toward said restricted passage forming a progressively decreasing width for said passageway causing resilient spreading of said spreadable portion allowing said support member to pass through said restricted passage from said open area to the outside of said clip for removing said comb from said support member, wherein said teeth, said trunk, said handle and said clip are integrally formed in one piece substantially in a single flat plane, wherein said support member is disposed substantially transverse to said plane when said comb is suspended from said support member with said support member positioned in said open area in said clip and wherein said support member is a motor car interior rear-view mirror support bracket.

4,317,466

HYDRAULIC DRIVE CIRCUIT FOR LOAD-HANDLING MACHINES

Akinori Ikeda, Chiba; Fuyuki Nagai, Saitama, and Takashi Okuno, Ibaraki, all of Japan, assignors to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan

Filed Apr. 1, 1980, Ser. No. 136,391
Claims priority, application Japan, Apr. 5, 1979, 54-40339
Int. Cl.³ F15B *13/02*
U.S. Cl. 137—115 **10 Claims**



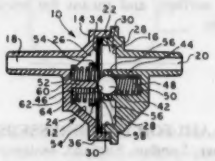
1. A drive circuit for a hydraulic load-handling machine comprising a hydraulic pump, a main relief valve provided on the delivery side of said hydraulic pump for determining the maximum output pressure of said drive circuit and means for raising the relief pressure of said main relief valve above a rated pressure of said circuit for a short time period of about a few seconds and then automatically returning said relief pressure to a level equivalent to said rated pressure.

4,317,467

TWO-WAY PRESSURE RELIEF VALVE

James H. Heyland, Schaumburg, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Jul. 10, 1980, Ser. No. 167,302
Int. Cl.³ F16K *17/196*
U.S. Cl. 137—493 **8 Claims**



1. A two-way valve comprising: a two-piece plastic housing having a first port, a second port, and a valve chamber communicating between said ports; a resilient elastomeric diaphragm extending across said chamber and sealed by said housing, said diaphragm including a centrally disposed aperture having an inner surface portion forming a valve seat; a ball-shaped element supported within said chamber in aligned relation to said valve seat, said housing having a second chamber for receiving and supporting said ball element in aligned relation to said valve seat; and biasing means for urging said ball element and said valve seat into sealing engagement, said ball element being moveable away from said valve seat responsive to a fluid pressure at said first port which is greater than the fluid pressure at said second port by a predetermined amount for establishing a first fluid flow path from said first port, through said diaphragm aperture, and to said second port, and said diaphragm being moveable away from said ball element for displacing said valve seat therefrom responsive to a fluid pressure at said second port which is greater than the fluid pressure at said first port by a predetermined amount for establishing a second fluid flow path from said second port, through said diaphragm aperture, and to said first port.

4,317,468

PRESSURE RELIEF VALVE

Edwin L. Schwartz, and Allen W. Langan, both of Los Angeles, Calif., assignors to Rite Autotronics Corporation, Los Angeles, Calif.

Filed Oct. 22, 1979, Ser. No. 87,401
Int. Cl.³ F16K *15/02*
U.S. Cl. 137—540 **13 Claims**

1. In a relief valve apparatus comprising a valve body having a centrally disclosed and longitudinally extending cavity therein,

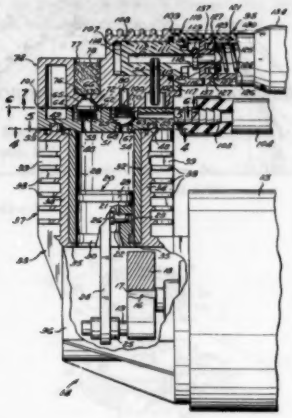
one end of said valve body having a first opening therein adapted to communicate with a source of air under pressure,

a valve assembly disposed in said valve body adapted to control the flow of air from said source to said cavity, and

biasing means disposed in said valve body adapted to exert a biasing pressure on said valve body tending to exert a longitudinally directed force on said valve assembly to thereby close said opening and prevent the flow of air from said source to said cavity, the improvement comprising:

a first pressure control means for pre-setting the degree of force exerted on said biasing means,

said first pressure control means including a first adjustment means and a second adjustment means operatively associated with said first adjustment means, and



a second pressure control means operatively associated with said first pressure control means for further controlling the degree of force exerted by said biasing means,

whereby three methods of adjusting the force of said biasing means is provided.

4,317,469

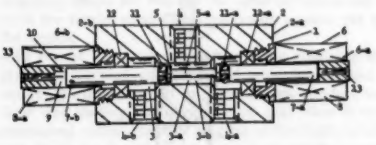
MOMENTARY CONTACT DIVERTER VALVE

Richard S. Pauliukonis, 6660 Greenbriar Dr., Cleveland, Ohio 44130

Continuation-in-part of Ser. No. 9,678, Feb. 5, 1979, Pat. No. 4,231,399. This application Jul. 17, 1980, Ser. No. 169,826

Int. Cl.³ F16K *31/06*

U.S. Cl. 137—625.65 **6 Claims**



1. A momentary contact diverter valve comprising:

an elongated valve housing with a bore passing therethrough between a first and a second housing ends closed by a pair of electrical solenoid operators with operator cavities forming an extension of said housing bore adaptable of slidably receiving a valving spool with dual seals in an operable relationship therebetween,

a plurality of fluid ports along said housing length including a fluid supply and exhaust port means entering said bore through a housing wall perpendicularly so as to allow fluid valved enter a first port serving as a fluid supply port for communication with a second port serving as a first fluid receiver port while a third port serving as a second fluid receiver port is disconnected therefrom by a first spool seal when said spool is in a first position having a first spool end abut a first stop of a first solenoid operator inside a first operator cavity,

and when said spool is shifted to a second position opposite said first position so as to have a second spool end abut a second stop of a second solenoid operator inside a second operator cavity while forming a gap at the first spool end against said first stop, fluid flow is diverted from said first fluid supply port for communication with said third port while said second port is disconnected therefrom by a second spool seal, and vice versa,

including a pair of detachable seals inside bore ends adjacent said operators, and a first detachable seal is held fixed by a first operator inside said first housing end while a second detachable seal is held fixed by a second operator inside said second housing end,

said spool position change with flow reversals dependent on solenoid operators wherein a brief energization of solenoid coils of either of said operators electrically by a momentary pulse provides a powerful means for spool shifting magnetically acting over said spool ends inside said operator cavities,

said valve housing, said spool with said dual seals spaced a short distance apart substantially in the center thereof and movable therewith when spool is shifted for said position change, said detachable seals inside said housing ends closed by said solenoid operators readily adaptable for maintenance thereof wherein removal of one of said operators permits spool withdrawal from said bore for servicing and subsequent return thereto without the need of valve removal from the system it serves.

4,317,470

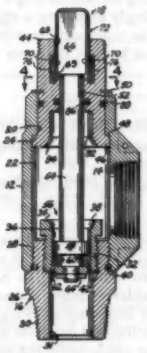
RUPTURE BAND RELIEF VALVE

Julian S. Taylor, 8300 SW. 8, Oklahoma City, Okla. 73108

Filed Jun. 13, 1980, Ser. No. 159,263

Int. Cl.³ F16K *13/04*

U.S. Cl. 137—70 **11 Claims**



8. A relief valve comprising:

a housing;

means at one end of the housing forming an inlet passage;

valve means sealing with and normally closing the inlet passage,

said valve means including a stem;

a plug closing the end of said housing opposite the inlet passage,

said plug having a bore surrounding said stem intermediate its ends; and,

generally U-shape band means extending transversely across the end portion of said stem opposite the inlet passage and supported by said plug for maintaining said valve means in inlet passage closed position,

said stem acting to extend said band means beyond its tensile strength limit in response to predetermined pressure against said valve means releasing the seal between said valve means and the inlet passage.

4,317,471

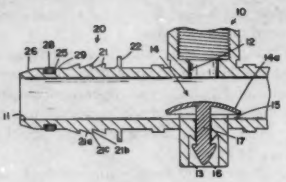
ATTACHMENTS FOR FLEXIBLE OR RIGID TUBING

Lloyd H. King, Sr., 311 Blake Rd., Hopkins, Minn. 55343

Division of Ser. No. 875,425, Feb. 6, 1978, abandoned. This application Apr. 9, 1979, Ser. No. 28,490

Int. Cl.[3] F16L *25/00;* F03B *7/08*

U.S. Cl. 137—798 3 Claims



1. An attachment having a multiple male connector for forming a leak-proof connection to either a rigid tubing or a flexible tubing, said multiple male connector having a first tubing engaging surface for forming sealing engagement with a flexible tubing and a second tubing engaging surface for forming sealing engagement with a rigid tubing, said male connector including a frusto-conical region to facilitate insertion of said male connector into a tubing, said first tubing engaging surface having a set of concentric spaced annular ridges which are operable for engaging the interior of a flexible tubing, said second tubing engaging surface having a region slightly smaller than the inside diameter of a rigid tubing suitable for connection thereto, said second tubing engaging surface having a diameter less than said first tubing engaging surface, said second tubing engaging surface comprises a cylindrical region located adjacent to said first tubing engaging surface, said second tubing engaging surface having a sealing ring extending therearound for sealingly engaging a rigid tubing so that said male connector can be connected to either a rigid tubing or a flexible tubing but not both at the same time.

4,317,472

REPLACEABLE BLADDER ACCUMULATOR DEVICE

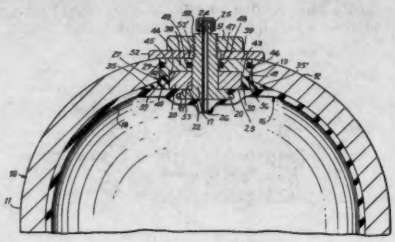
Abduz Zahid, Los Angeles, Calif., assignor to Greer Hydraulics Incorporated, Chatsworth, Calif.

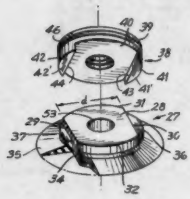
Filed Aug. 14, 1980, Ser. No. 178,144

Int. Cl.[3] F16L *55/04*

U.S. Cl. 138—30 9 Claims

1. A top repairable accumulator device comprising a pressure vessel having an oil port at one end and being closed at the other end, said closed end having an axially extending bore formed therein, a bladder assembly mounted at said other end, said bladder assembly including an elongate rigid stem having an annular flange portion of a diameter smaller than said bore, said stem including an axially directed gas charging passage, a bladder member including a mounting aperture molded over and bonded to said flange, a separable locking ring mounted on said stem, said ring having a diametric portion of larger diameter than said bore, and a second diametric portion including opposed reduced side edge portions spaced apart a distance less than the diameter of said bore, whereby said ring is endwise insertable into the interior of said vessel through said bore when inclined in the direction of the axis of said vessel, said ring including a central aperture of diameter larger than said stem and smaller than said flange, said stem projecting outwardly through said aperture and through said bore whereby said ring is sandwiched between the walls of said vessel surrounding said bore and said flange, a retaining plate extending downwardly into said bore, said plate including downwardly facing land portions shaped complementally to said reduced side portions, said land portions being disposed in juxtaposition to said side portions, said plate having an outer diameter portion fitting with close tolerance within said bore, and an inner aperture surrounding said stem, a thread portion formed on said stem outside said vessel and a lock nut assembly threadedly mounted on said threaded portion of said stem and including an undersurface reacting against said vessel, said nut assem-





bly clampingly urging said flange outwardly against said ring and said plate inwardly against said ring, thereby removably to secure said bladder assembly within said pressure vessel.

4,317,473

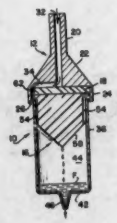
FLUID FLOW CONTROL ASSEMBLY

Joseph A. Gaydos, Clifton, N.J., assignor to Becton, Dickinson and Company, Paramus, N.J.

Filed Dec. 31, 1979, Ser. No. 108,955

Int. Cl.[3] F15D *1/14*

U.S. Cl. 138—45 6 Claims



1. A fluid flow control assembly for the controlled metering of the flow of fluid between a fluid inlet and a fluid outlet thereof, which comprises:

a fluid receiving member having a fluid inlet and fluid passageway means in fluid flow communication with said fluid inlet; and

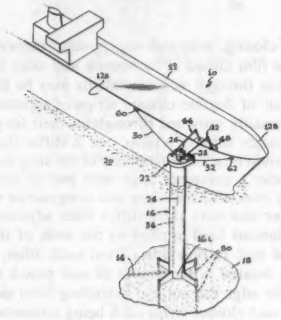
a fluid dispensing member having a fluid outlet and including a plurality of calibrated fluid flow passageways and a fluid chamber, said fluid dispensing member being rotatably mounted to said fluid receiving member, said fluid dispensing member being formed with a cylindrically-shaped inner side wall in which is positioned a fluid control member of cylindrical shape and having a plurality of varying sized channels formed transverse thereof thereby forming with said inner surface of said sidewall of said fluid dispensing member said plurality of calibrated fluid

flow passageways, wherein said cylindrically-shaped fluid control member is formed with a conically shaped bottom portion to form a site for droplet formation of said fluid, whereby each of said calibrated fluid flow passageways is selectively positionable with respect to said fluid passageway means of said fluid receiving member thereby to meter in a predetermined manner the flow of fluid through said assembly to said fluid outlet.

4,317,474
MOORING TERMINAL FOR TRANSFERRING DIFFICULT CARGO

James M. Kentosh, Los Angeles, Calif., assignor to Amtel, Inc., Providence, R.I.

Filed Mar. 3, 1980, Ser. No. 126,308
Int. Cl.³ B65B *3/04*
U.S. Cl. 141—1 **10 Claims**



1. A mooring and cargo transfer system for transferring a fluid between an undersea line and vessel, comprising:

a table support;

means for anchoring said support at a location over a sea floor;

a table device rotatably connected to said support about a substantially vertical axis, said table device having a fender means for bearing against a vessel, and also having coupling means for holding the table device to the vessel with the fender means bearing firmly against the hull of the vessel;

a fluid swivel having a rotatable portion rotatable about a primarily vertical axis with said table device, and a stationary portion coupled to the undersea conduit; and

at least one loading arm mounted on said table device and connected to the rotatable portion of the fluid swivel, said arm having a length great enough to reach beyond the side of a vessel abutting said fender means, whereby the arm can connect to the vessel to carry fluid between the vessel and the undersea line.

4,317,475
LIQUID FILLING AND LEVEL SENSING APPARATUS

Cardell E. Miller, Hudson, Wis.; Robert F. Folley, St. Paul, and Ralph H. Larson, Bayport, both of Minn., assignors to Nordson Corporation, Amherst, Ohio

Filed Oct. 23, 1980, Ser. No. 199,956
Int. Cl.³ B65B *3/04*
U.S. Cl. 141—95 **10 Claims**

1. Container filling apparatus comprising:

(a) a supply of fluid to be dispensed into said container;

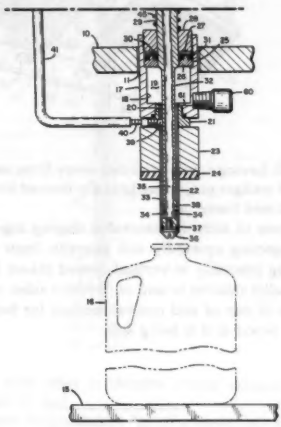
(b) a pressure actuated filler and level sensing valve member characterized by:

(1) a body member having a longitudinal bore formed therein defining a chamber and a coaxial counterbore extending from said chamber through said body member,

(2) a combination venting and pressure sensing tube of a predetermined length and inner dimension sealingly inserted through said counterbore,

(3) a tubular piston extending coaxially through said chamber in said body member and having a product tube portion of an outer dimension less than said inner dimension of said venting and pressure sensing tube telescopingly received within said venting and pressure sensing tube to define an annular passage communicating with said chamber and extending between said venting and pressure sensing tube and said product tube portion, said product tube portion having at least one port formed through its side wall proximate its distal end, and

(4) seal means disposed between the inside surface of said venting and pressure sensing tube and the outside surface of said product tube portion on opposite sides of said port when said tubular piston is retracted,



(c) means coupling said supply of fluid to the lumen of said tubular piston;

(d) means including the container to be filled for extending said distal end of said product tube portion outwardly of the distal end of said venting and pressure sensing tube to unblock said port such that said fluid may flow from said supply through said tubular piston and said product tube portion;

(e) air pressure actuated control means coupled to said annular passage responsive to a predetermined change in pressure in said annular passage; and

(f) means controlled by said control means for retracting said distal end of said product tube into said venting and pressure sensing tube to block said port when said predetermined change in air pressure in said annular passage is sensed.

4,317,476
WOOD SPLITTING DEVICE

Edward S. Radzik, 1811 11th La., Friendship, Wis. 53934

Filed Nov. 27, 1979, Ser. No. 97,653
Int. Cl.³ B27L *7/00*
U.S. Cl. 144—194 **4 Claims**

1. A portable wood splitting device for use with a self-propelled motor vehicle, comprising:

(a) a frame adapted to rest on the ground and having a pair of upwardly extending brackets disposed at a lateral side thereof and projecting laterally beyond said frame;

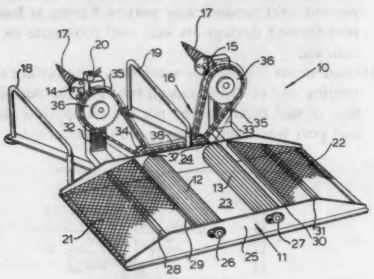
(b) a pair of parallel horizontal drive rollers rotatably supported on said frame between said brackets and adapted to

support and to be driven by a driven wheel of the motor vehicle when the same is supported thereon;

(c) a pair of horizontal shafts rotatably supported at the upper end of said brackets for rotation about a pair of axes disposed well above the axes of said drive rollers;

(d) means drivably interconnecting each of said drive rollers with both of said horizontal shafts

(e) a pair of threaded conical wedges respectively corotatably and coaxially secured to said horizontal shafts, and



each having a point directed away from said drive rollers, said wedges projecting laterally beyond both said brackets and said frame; and

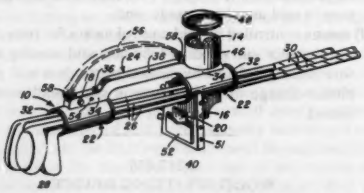
(f) a pair of slidably removable sloping log-centering stops projecting upwardly and laterally from said frame and lying generally in vertical spaced planes in spaced offset parallel relation to and at opposite sides of the rotational axis of one of said conical wedges for being engaged by the wood as it is being split.

4,317,477

GOLF CLUB CARRIER

Roberto J. Baptista, Caracas, Venezuela, assignor to Roanto Investment N.V., Caracas, Venezuela

Filed Aug. 18, 1980, Ser. No. 178,762
Int. Cl.³ A63B *55/04*
U.S. Cl. 150—1.5 B **5 Claims**



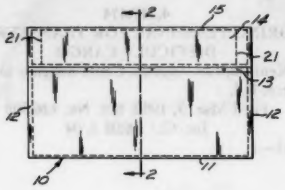
1. A golf club carrier comprising a pair of longitudinally spaced open ended tubes, said tubes being generally aligned along a common axis, a rigid handle generally paralleling said tubes and extending therebetween, said handle having opposed ends overlying and fixed to said tubes, said handle, between said tubes, being upwardly offset relative to the upper surfaces of the tubes to provide for an unencumbered hand-grip portion between said tubes, and a ball container mounted over one of said tubes, said container including an opening therein with a movable closure therefor.

4,317,478

SELF-CLOSING, SNAP-OPEN POUCH AND METHOD OF MAKING SAME

Lewis E. Babbidge, 16374 Euclid Ave., Cleveland, Ohio 44112

Continuation-in-part of Ser. No. 656,228, Feb. 9, 1976, abandoned. This application May 29, 1979, Ser. No. 43,000
Int. Cl.³ B65D *33/30*
U.S. Cl. 150—10 **3 Claims**



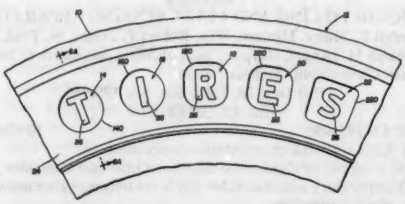
1. A self-closing, snap-opening pouch comprising flexible heat-sealable film closed at its bottom and sides to provide a mouth portion through which contents may be filled and removed, a pair of flexible closure strips of substantially equal length and equally crowned throughout their lengths so that, of the two major sides of a strip, one is stiffer than the other and there should be a lesser tendency of the strip to flex toward that side under a columnar load, said pair of strips being in substantially over-all parallelism and congruence with respect to each other and with their stiffer sides adjacent, whereby, under a columnar load applied to the ends of the pair, said strips should tend to bow away from each other, said pair of strips being located in the mouth of said pouch substantially parallel to the edge thereof and extending from side to side of said pouch, said closure strips each being connected with said flexible film adjacent said mouth to maintain the corners of the ends of one of said strips in juxtaposition with corresponding corners of ends of the other strip, at least one of said closure strips, adjacent an end thereof, being bent transversely so that the bent end portion extends at an obtuse angle to the stiffer side of said strip whereby, in the absence of endwise pressure on said closure strips, said strips hold said mouth substantially closed and, upon the application of endwise pressure to the ends of the pair of closure strips, said strips bow away from each other and the connection of said closure strips to said flexible film causes said closure strips to bear upon and move pivotally with respect to each other at the corners, only, of said ends when said closure strips bow away from each other.

4,317,479

ADDITION MEMBERS FOR RUBBER ARTICLES

Peter McDonald, Hudson, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Aug. 19, 1980, Ser. No. 179,601
Int. Cl.³ B60C *13/00*
U.S. Cl. 152—353 R **16 Claims**



1. A pneumatic tire for vehicles in general, which comprises on at least one of the sidewalls thereof, intermediate the bead and the outer tread portions of said tire, a plurality of circumferentially spaced independent first coupling means portions,

with each one of said first coupling means portions being adapted to operatively interact singly and independently with a second coupling means portion on each one of a plurality of independent detachable and circumferentially spaced nonabutting tire sidewall trim addition members for securing said members to said tire sidewall, each of said addition members including a continuous peripheral margin, with said second coupling means portions comprising said margins.

4,317,480

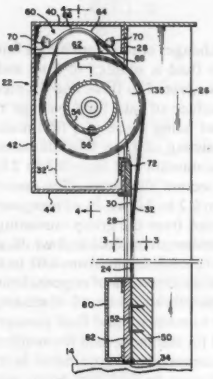
INSULATING WINDOW BLIND

N. Eric Phelps, 16060 NE. 165th St., Woodinville, Wash. 98072

Filed Jun. 9, 1980, Ser. No. 157,466

Int. Cl.³ E06B *9/08, 9/20*

U.S. Cl. 160—23 R **16 Claims**



1. An insulating blind assembly for a window, comprising:

a retractable roll of blind material having its free end sealable against the window sill;

a cartridge surrounding and protecting the roll of blind material and providing an airtight seal at the top of the roll when the roll is fully extended;

steel tapes rolled onto and with the blind material at the lateral edges thereof to provide spacing between convolutions of the rolled blind material, said tapes fixed with respect to the blind material only at the opposite ends of the tapes;

tracks adapted to being positioned along the side margins of a window frame or the like; and

magnetic strips fastened along the tracks, said steep tape being attracted to the magnetic strips to sandwich portions of the roll of blind material therebetween to form an airtight seal against the magnetic tape whereby the window blind assembly traps an insulating layer of air between itself and the window in the fully extended position of the blind.

4,317,481

THERMAL BARRIER

Samuel G. Oswald, 1009 Barlow, Traverse City, Mich. 49689

Filed Jan. 14, 1980, Ser. No. 111,723

Int. Cl.³ A47H *5/00*; E06B *3/94*

U.S. Cl. 160—84 R **8 Claims**

1. For use in conjunction with a building having a window oriented in substantially a vertical plane, a thermal barrier comprising:

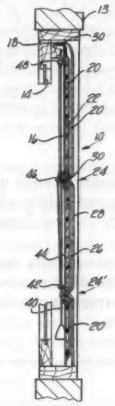
a flexible sheet having substantially the same shape and size as the window,

a plurality of rigid, elongated and rectangular slats, said slats being constructed of a synthetic thermal insulating material;

means for securing said slats to one side of said sheet so that said slats extend horizontally across said assembly, the longitudinal edges of each slat being parallel to and adjacent the longitudinal edges of the adjacent slats, said sheet and said slats forming an assembly in which the sheet hingedly secures the adjacent edges of adjacent slats together;

means for attaching an upper edge of the assembly to the building above the window at a position spaced from said window by an amount at least as great as the combined thicknesses of said slats,

means for moving said assembly between a lower position and an upper position so that in said lower position, said assembly is positioned substantially entirely across said window so that said side of said sheet faces away from the window and so that in said upper position, said slats are



stacked upon each other to thereby expose substantially all of the window; and

wherein the lower longitudinal edge of every other slat is spaced upwardly from the upper longitudinal edge of the next lower slat to thereby form a horizontally extending open space therebetween and wherein said moving means further comprises a cord secured at one end to the other side of said sheet opposite from the lowermost open space, said cord being slidably attached to the other side of said sheet opposite from every other open space, and means for slidably attaching said cord to said building above said window so that when said assembly is in its upper position, said slats lie substantially in a vertical plane and are stacked between the window and said upper edge of the assembly.

4,317,482

METHOD FOR PREVENTING DAMAGE TO STRAND GUIDE ELEMENTS OF A CONTINUOUS CASTING INSTALLATION FOR STEEL

Manfred Wolf, Zurich, Switzerland, assignor to Concast AG, Zurich, Switzerland

Continuation of Ser. No. 60,686, Jul. 25, 1979, abandoned. This application May 11, 1981, Ser. No. 262,036

Claims priority, application Switzerland, Aug. 11, 1978, 8558/78

Int. Cl.³ B22D *11/16*

U.S. Cl. 164—454 **4 Claims**

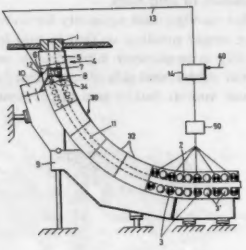
1. A method of avoiding damage to strand guide elements of a strand guide arrangement of a continuous casting installation for metals, especially steel, due to metal break-out, comprising the steps of:

continuously casting a strand in a continuous casting mold;

guiding and supporting the continuously cast strand at a strand guide arrangement;

withdrawing the cast strand out of the continuous casting mold and through the strand guide arrangement;

determining at preselected locations of the strand guide arrangement the withdrawal forces which are effective thereat during the strand withdrawal operation owing to strands which have undesirably welded with parts of the strand guide arrangement due to metal which has spilled-out;



deriving from such determination measured values;

comparing the measured values with predetermined maximum values which prevent damage to the strand guide arrangement; and

when during such comparison step the measured values exceed the predetermined maximum values generating a command for interrupting the strand withdrawal operation.

4,317,483

HEAT EXCHANGER

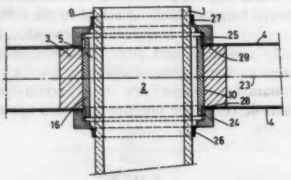
Jean-Pierre Denis, Waterloo, Belgium, assignor to Jean-Hughes Denis, Monaco, Monaco

Filed Sep. 13, 1978, Ser. No. 941,867

Claims priority, application Luxembourg, Sep. 13, 1977, 78118

Int. Cl.³ F16L *41/00*; F28F *1/00*

U.S. Cl. 165—81 **7 Claims**



1. Heat exchanger with tubes mounted in tubular bearing plates, each plate being provided with passage openings for said tubes, the cross-section area of said openings being larger than the outer cross-section of the tubes proper and a sleeve being provided between each tube and the tubular bearing plates, which includes at least one lip which bears resiliently and substantially tightly against the outer wall of the tube passing through the openings while retaining said tube some distance away from the edges bounding the openings, said sleeve being made of at least two different separable pieces, a first one being arranged at least partly inside said opening about the tube, a part of this first piece outside the opening being applied around the opening, against an outside surface of one of said bearing plates, a second piece being a ring screwed to an end of said first one, opposite to said part, against an opposite outside surface of one of said tubular bearing plates.

4,317,484

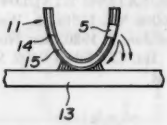
HEAT EXCHANGER CORE

Zenichi Tanabe, Nagoya; Toshiyasu Fukui; Hiroshi Ikeda, both of Toyoake; Tatsuo Miura, Kariya, and Taketoshi Sugiura, Okazaki, all of Japan, assignors to Sumitomo Light Metal Industries, Ltd., Tokyo and Nippondenso Co., Ltd., Kariya, both of, Japan

Filed Jun. 12, 1980, Ser. No. 158,744

Int. Cl.³ F28F *19/06*

U.S. Cl. 165—134 R **6 Claims**



1. A heat exchanger core comprising a fluid passage member within which a fluid is adapted to flow and outside of which another fluid is adapted to flow, and fin members mounted on the external surface of said fluid passage member; said fluid passage member being made of a first material selected from the group consisting of (1) a first aluminum alloy consisting essentially of aluminum and from 0.2 to 2.0 wt. % of manganese and (2) a second aluminum alloy consisting essentially of aluminum, from 0.2 to 2.0 wt. % of manganese and at least one substance selected from the group consisting of from 0.1 to 2.0 wt. % of magnesium, from 0.01 to 5 wt. % of chromium, from 0.01 to 0.5 wt. % of titanium, from 0.01 to 0.5 wt. % of zirconium, from 0.01 to 1.0 wt. % of copper, from 0.01 to 1.0 wt. % of iron and from 0.01 to 2.0 wt. % of silicon, said first material being effective to maintain said fluid passage member cathodic relative to said fin members; said fin members being made of a brazing sheet comprising a core metal layer and at least one cladding metal layer on said core layer, said core metal layer being made of a second material selected from the group consisting of (3) a third aluminum alloy consisting essentially of aluminum and from 0.01 to 0.09 wt. % of tin and (4) a fourth aluminum alloy consisting essentially of aluminum, from 0.01 to 0.09 wt. % of tin and at least one substance selected from the group consisting of from 0.1 to 2.0 wt. % of magnesium, from 0.1 to 2.0 wt. % of manganese, from 0.1 to 5.0 wt. % of zinc, from 0.01 to 2.0 wt. % of copper, from 0.01 to 0.5 wt. % of chromium, from 0.01 to 0.5 wt. % of zirconium, from 0.01 to 2.0 wt. % of iron, and from 0.01 to 1.0 wt. % of silicon, said second material being effective to maintain said fin members in an anodic state relative to said fluid passage member, said cladding metal layer being made of a brazing material selected from the group consisting of (5) a fifth aluminum alloy consisting essentially of aluminum and from 6 to 14 wt. % of silicon and (6) a sixth aluminum alloy consisting essentially of aluminum, from 6 to 14 wt. % of silicon and from 0.3 to 2.0 wt. % of magnesium; said fin members being soldered to the external surface of said fluid passage member and being effective as sacrificial anodes to protect said fluid passage member from corrosion.

4,317,485

PUMP CATCHER APPARATUS

Richard J. Ross, Houston, Tex., assignor to Baker International Corporation, Orange, Calif.

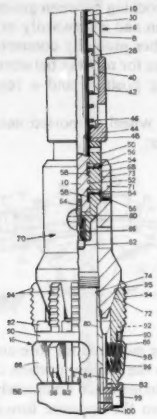
Filed May 23, 1980, Ser. No. 153,102

Int. Cl.³ E21B *33/129*

U.S. Cl. 166—216 **8 Claims**

1. A pump catcher apparatus for supporting within a subterranean well conduit a portion of a tubular conduit and a pump depending from the tubular conduit, comprising: a control mandrel; telescoping means including said control mandrel connectable to said tubular conduit; a main body axially extending from said control mandrel; means on said main body for anchoring said pump catcher to the wall of the well con-

duit, said anchoring means being selectively shiftable to anchoring engagement with the well conduit wall by axial manipulation of the tubular conduit; severable means between said control mandrel and said main body permitting only limited axial relative displacement of said mandrel and said main body,



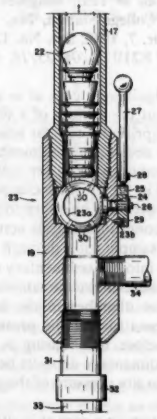
said severable means being severable upon the occurrence of a predetermined axial force between said mandrel and said main body; and shock absorbing means for protecting said severable means from axial impact forces less than said predetermined axial force.

4,317,486

CEMENTING HEAD APPARATUS AND METHOD OF OPERATION

Monty E. Harris, Cleveland, Okla., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 10, 1980, Ser. No. 128,798
Int. Cl.³ E21B *33/05*
U.S. Cl. 166—250 **8 Claims**



1. A cementing head apparatus for injecting a cementing plug into a well casing, the apparatus comprising:

means defining a fluid chamber having top and bottom ends, the chamber being adapted to contain an operating fluid;

means defining a fluid inlet, in communication with the inside of the fluid chamber and a source for the operating fluid, said inlet being adapted to carry the operating fluid into the fluid chamber;

a plug housing having top and bottom ends, the top end being coupled into the bottom end of the fluid chamber, the plug housing being adapted for retaining a cementing plug;

a plunger, the plunger being positioned inside the fluid chamber, and the plunger being movable in said chamber, by the action of the operating fluid, between a rest position and an extended position;

a valve housing having top and bottom ends, the top end being coupled into the bottom end of the plug housing; and the bottom end being coupled into the well casing;

a control valve having a bore therein, said valve being installed inside the valve housing, and the valve being movable in the housing between a closed position and an open position;

a cement inlet, mounted on the valve housing below the control valve, coupled into a source for a cement slurry, and adapted for carrying the slurry into the valve housing;

wherein, the wiper plug is adapted to be pushed through the valve bore by the plunger, by moving the control valve to its open position and moving the plunger to its extended position.

7. Method for injecting a cementing plug into a well casing behind a cement slurry, the method comprising the steps of:

positioning a cementing plug in the plug housing of a cementing head apparatus;

injecting a predetermined amount of a cement slurry into the well casing through a cement inlet positioned in a valve housing, the valve housing being installed in said apparatus below the cementing plug;

opening a control valve installed in the valve housing;

directing an operating fluid against a movable plunger installed in a fluid chamber positioned in said apparatus above the cementing plug;

causing the plunger to move into contact with the cementing plug;

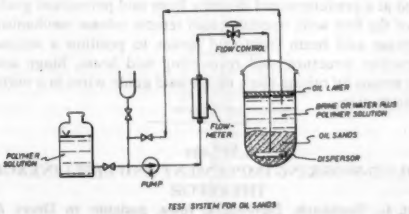
further moving the plunger, by the action of the operating fluid, to cause it to push the cementing plug through the open control valve and into a position below the cement inlet.

4,317,487

METHOD OF RECOVERING OIL AND OTHER HYDROCARBON VALUES FROM SUBTERRANEAN FORMATIONS

George G. Merkl, Haworth, N.J., assignor to Molecular Energy Research Company, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 934,509, Aug. 17, 1978, abandoned. This application Jul. 13, 1979, Ser. No. 56,441
Int. Cl.³ E21B *43/18, 43/22*
U.S. Cl. 166—305 R **14 Claims**



TEST SYSTEM FOR OIL SANDS

1. Method of recovering petroleum values from subterranean formations which comprises:

contacting at least a portion of the petroleum within the formation with an effective amount of an aqueous solution of a polymeric complex capable of releasing active hydro-

gen under the temperature and pressure conditions of the formation

in a manner and for a time sufficient to permit the active hydrogen released by the polymeric complex to react with the petroleum within the formation,

whereby low molecular weight hydrocarbons are produced in situ, generating an increased formation pressure adequate to produce petroleum values from at least one well drilled into said formation.

4,317,488

APPARATUS FOR USE IN PLACING A SUBMARINE STRUCTURE ON THE SEA BED ALONGSIDE AN UNDERWATER WELL AND METHOD OF DRILLING A PLURALITY OF CLOSELY SPACED UNDERWATER WELLS

Keith Shotbolt, Gerrards Cross, England, assignor to The British National Oil Corporation, London, England

Filed Feb. 14, 1980, Ser. No. 121,453

Claims priority, application United Kingdom, Feb. 15, 1979, 5452/79; Apr. 9, 1979, 12469/79

Int. Cl.³ E21B *33/035*

U.S. Cl. 166—351 **12 Claims**

1. A method of locating first and second spaced underwater structures of which said first structure is a hydrocarbon well, such method comprising drilling a hole for said well; lowering a permanent guide base and conductor piping into position in relation to said hole, providing guide wires extending back from the permanent guide base to the drilling rig at the surface; attaching to said guide wires a beam having at a first end guide means for cooperation with the guide wires to guide said beam vertically down the guide wires, and having at the other end a remote release mechanism to permit attachment to and release of a means to position a second underwater well, the first end of said beam being attached to said guide means by way of a hinge permitting the beam to be pivoted between a vertical orientation and a horizontal orientation; attaching to said remote release mechanism a means to position said second underwater structure; lowering said beam in a vertical orientation down said guide wires to the permanent guide base of the first well; at the permanent guide base pivoting said beam into a horizontal orientation to bring said means to position said second underwater structure into a position at the sea bed spaced at a predetermined distance from said permanent guide base of the first well; operating said remote release mechanism to release said beam from said means to position a second underwater structure; and recovering said beam, hinge and guide means by raising them up the said guide wires in a vertical orientation.

4,317,489

GROUND-WORKING IMPLEMENT AND LIFT LINKAGE THEREFOR

James G. Steinbach, Davenport, Iowa, assignor to Deere & Company, Moline, Ill.

Continuation of Ser. No. 964,243, Nov. 27, 1978, abandoned. This application Jun. 20, 1980, Ser. No. 161,522

Int. Cl.³ A01B *63/22*

U.S. Cl. 172—400 **33 Claims**

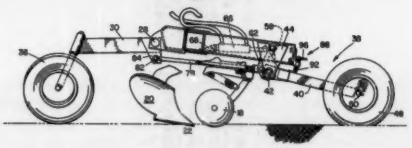
31. In a ground-working implement having an elongated frame adapted for forward movement over the ground and having a longitudinal axis angled with respect to the forward direction, a lift assembly comprising:

a rigid fore-and-aft extending wheel frame including a fore-and-aft extending hollow portion;

a first arm member having upper and lower ends and pivotally connected near its upper end to the fore end of the wheel frame for rocking between generally a downwardly extending position and a forwardly extending position;

a second arm member pivotally connected near the aft end of the wheel frame for rocking between generally a downwardly extending position and a rearwardly extending position;

a ground-engaging wheel supported near the lower end of each arm member;



a hydraulic cylinder mounted for fore-and-aft extension and retraction within the hollow portion of the wheel frame, wherein said cylinder when completely extended remains contained between the opposite fore-and-aft ends of the wheel frame;

means responsive to the extension and retraction of the cylinder for rocking the first and second arm members generally at a differential rate between their respective positions to rock and to raise and lower the wheel frame; and

means connecting the wheel frame to the elongated frame with the wheels located on opposite sides of the longitudinal axis of the elongated frame for rocking and raising and lowering the elongated frame with the wheel frame.

4,317,490

APPARATUS AND METHOD FOR OBTAINING A CORE AT IN SITU PRESSURE

Lionel J. Milberger, Spring; Eddie W. Denk, Bryan, and Kai R. Hostrup, Garland, all of Tex., assignors to Texas A & M University System, College Station, Tex.

Filed Mar. 7, 1980, Ser. No. 128,104

Int. Cl.³ E21B *25/04, 25/18, 49/00*

U.S. Cl. 175—20 **19 Claims**

1. Apparatus for obtaining a core at in situ pressure of the sedimentary deposits at the bottom of a well bore, a body of water or the like comprising a tubular housing adapted to be moved into position above the sedimentary deposits to be cored, a pressure chamber in the lower section of the housing, a sample tube located in the pressure chamber, valve means at the lower end of the pressure chamber to open and close the chamber to ambient conditions, means actuated from the surface for moving the sample tube through the open valve to force the sample tube into the sedimentary deposits to obtain a core of said deposits and to move the sample tube with the core back into the pressure chamber in the housing, means for closing the valve means to seal the pressure chamber from ambient conditions before the housing is removed from its position above the sedimentary deposits being cored to maintain substantially the in situ pressure of the core in the pressure chamber.

16. A method of obtaining a core at in situ pressure from the sedimentary deposits at the bottom of a well bore, a body of water or the like comprising the steps of lowering a housing having a valve in the lower end thereof to a position above the sedimentary deposits, extending an open-ended sample tube from the housing through the open valve into the sedimentary deposits to force a core of the deposits into the sample tube, retracting the sample tube with the core therein into the hous-

ing above the valve, moving the valve element of the valve to its closed position, exerting a downward force on the valve element to hold the valve element in sealing engagement with

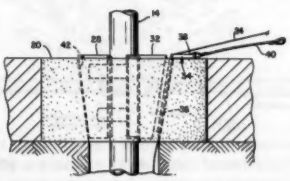
the seat to seal the bottom of the housing below the sample tube to trap ambient pressure in the housing around the sample tube, and raising the housing to the surface.

4,317,491

WIRELINE PROTECTOR

Homan C. Tullos, Lafayette, La., and Dewey W. Woods, Livingston, Tex., assignors to Tullos & Woods Tools, Inc., Lafayette, La.

Filed May 9, 1980, Ser. No. 148,393
Int. Cl.³ E21B *3/04*
U.S. Cl. 175—57 **16 Claims**



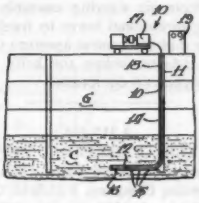
1. A wireline protector for protecting an electrical wireline used in a downhole drilling operation where such wireline passes through the opening in a drilling rotary table through which the drill string passes, said wireline protector comprising: an elongated section capable of extending through the opening in the rotary table without interfering with the drill string, said elongated section having an elongated opening into which the portion of the wireline passing through the rotary table can be inserted so as to be substantially surrounded by said elongated section for protecting the wireline; and a second flat section extending from the top of and along an axis lying approximately perpendicular to the axis along which said elongated section extends and said second section being capable of being arranged in engagement with the rotary table for maintaining said wireline protector in place.

4,317,492

METHOD AND APPARATUS FOR DRILLING HORIZONTAL HOLES IN GEOLOGICAL STRUCTURES FROM A VERTICAL BORE

David A. Summers; Clark R. Barker, and H. Dean Keith, all of Rolla, Mo., assignors to The Curators of the University of Missouri, Columbia, Mo.

Filed Feb. 26, 1980, Ser. No. 124,946
Int. Cl.³ E21B *4/00*
U.S. Cl. 175—79 **7 Claims**



1. Drilling apparatus including a source of fluid under high pressure connected to a flexible conduit, and a rotatable fluid jet nozzle connected to the conduit for drilling horizontal holes in geological strata from a vertical bore comprising:

a vertical drill stem carrying said conduit and having a chain of innerconnected, articulated links;

a nozzle drilling head attached to a lower end of said vertical drill stem and connected hydraulically to said conduit;

direction changing means attached at the lower end of said drill stem for directing said chain of links through a right angle turn from a vertical orientation to a substantially horizontal direction;

actuating means mounted on said direction changing means for directing the orientation of said nozzle drilling head at some desired depth; and

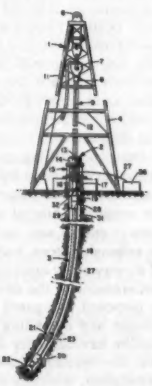
drive means attached to said direction changing means and operable for advancing and retracting said nozzle drilling head.

4,317,493

KELLY DRIVE BUSHING ADAPTER

Derry R. Thompson, 2826 Redwood Pl., Anchorage, Ak. 99504

Filed Jan. 4, 1980, Ser. No. 109,492
Int. Cl.³ E21B *7/08, 3/06*
U.S. Cl. 175—87 **10 Claims**



1. In a surface drilling assembly of the type employing in drilling boreholes in the earth and of the type including a kelly

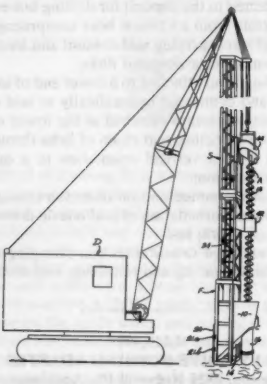
slideably engaged on a kelly drive bushing for rotation therewith and a rotary table for imparting rotary motion to the kelly and kelly drive bushing, said rotary table having a central aperture in axial alignment with the kelly through which the kelly is driven, the improvement comprising an adapter including spacing means for spacing the kelly drive bushing from the rotary table aperture, bushing engaging means for engaging the bushing for rotation therewith, adapter table engaging means for engaging the rotary table for rotation therewith so that the drive bushing is maintained in spaced relationship to the rotary table and rotated therewith and an entrance opening extending through at least one side of the adapter to permit a wireline of an electronic steering assembly of the type employed in drilling directional bores to freely and safely pass between the kelly and the central aperture in the rotary table and through the adapter below the kelly drive bushing to associated surface readout equipment.

4,317,494

MATERIAL REMOVAL DEVICE

Arthur A. Hightower, Olmsted Falls, Ohio, assignor to Lee Turzillo Contracting Company, Richfield, Ohio

Filed May 9, 1980, Ser. No. 148,514
Int. Cl.³ E02B *17/144*
U.S. Cl. 175—88 **1 Claim**



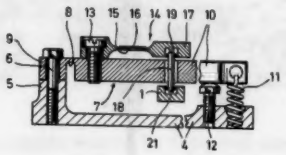
1. A material removal device for removing spoil from the flights of an auger comprising, an auger having flights thereon, a frame, a hollow spoil receiving container secured in said frame and having a container inclined floor, said container having a rounded rear portion having a rear portion inclined floor which forms an extension of said container inclined floor, a generally vertically disposed barrel portion secured to the rear portion inclined floor adjacent the upper end thereof for enclosing a preselected axial length portion of said auger with a snug operable fit, said auger being selectively longitudinally movable through the container barrel portion during drilling to permit the spoil from the drilling operation to be carried upwardly through the barrel portion by the auger flights and deposited in the container, said container also having a selectively lockable door vertically hinged on said container at a point adjacent the lower end of said inclined floor, said door and frame having a releasable door lock thereon, said frame having a plurality of downwardly extending spikes on its lower end enabling firm securement of the device during drilling, a generally vertically disposed elongated framework structure secured to said container and extending upwardly therefrom, said framework structure having auger drive means and auger guide means thereon for operating and guiding said auger during the drilling operation, whereby in operation the auger draws spoil up the barrel portion and thence into the container from which it may be selectively removed via said door, and a derrick for lifting said auger and said container and framework structure as a unit from a drilling site to a dumping site where said door may be opened to dump spoil from the container.

4,317,495

DEVICE FOR PROTECTING A FLEXURAL FORCE RECEIVER AGAINST OVERLOADING

Ernst Kuhnle, and Josef Schwarz, both of Balingen, Fed. Rep. of Germany, assignors to Bizerba-Werke Wilhelm Kraut KG, Fed. Rep. of Germany

Filed Sep. 2, 1980, Ser. No. 183,390
Claims priority, application Fed. Rep. of Germany, Sep. 7, 1979, 2936110
Int. Cl.³ G01G *21/10*
U.S. Cl. 177—157 **7 Claims**



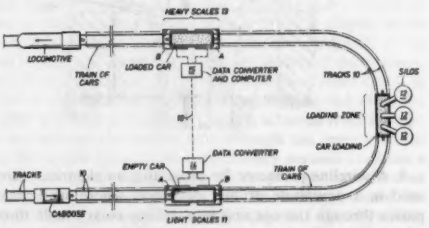
1. Device for protecting a flexural force receiver against overloading, comprising a beam and a flexural force receiver attached cantilevered at one end of said beam, flexural force being applied to the cantilever end of the flexural force receiver, wherein said beam is movable and is pretensioned counter to the direction of action of the flexural force against a first fixed stop; the value of the pretension being chosen so that the beam moves out of contact with the first stop counter to the pretension when the flexural force receiver is overloaded; and a second fixed stop is provided which prohibits the introduction of further force into the flexure bar.

4,317,496

IN-MOTION WEIGHING SYSTEM

Kenneth E. Krause, Sheridan, Wyo., assignor to Exxon Production Research Company, Houston, Tex.

Filed Jul. 23, 1979, Ser. No. 59,713
Int. Cl.³ G01G *21/22, 13/14*
U.S. Cl. 177—163 **17 Claims**



1. A weighing apparatus comprising a system especially adapted for weighing dynamic loads, said system comprising in combination:

(a) weighing means responsive to units having cargo-carrying body means with wheeled multi-axle means to be weighed while in motion comprising:

(i) platform means and

(ii) weight-responsive, electrical-signal-producing transducer means cooperative with said platform means,

whereby in a single time period, electric signals directly proportional to the actual weight of any of said units are generated only at one preselected position on each of said platform means and whereby other extraneous electric signals not representative of actual unit weight are continuously produced as each of said units traverses said platform means;

(b) position sensing means responsive only to said body means and adapted and constructed to generate an electrical signal under conditions whereby:

(i) only wheel means of units of predetermined cargo body length are on said platform means and

(ii) are directly over or near said transducer means and

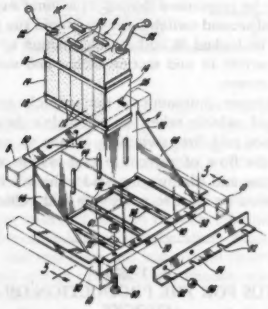
(iii) whereby said position signal emanates at or shortly before said actual weight signal from said transducer means;

(c) Calculating means responsive to both said transducer signals and position signals to intergrate said signals whereby said position signal regulates transducer signals thereby to generate a final signal that represents only the actual weight of any of said units.

4,317,497
BATTERY TRAY FOR ELECTRIC VEHICLE

Robert D. Alt; James H. Richardson, both of Warren, and Alverson B. Williams, Sterling Heights, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 28, 1980, Ser. No. 172,768
Int. Cl.³ B62D *25/00*
U.S. Cl. 180—68.5 **4 Claims**



1. A support for securing a battery pack in a vehicle, said pack comprising a plurality of batteries bound together between two end plates having first and second threaded mounting studs affixed thereto and projecting outwardly from opposite ends of said pack, said supporting comprising:

a substantially horizontal tray including an upstanding peripheral rim, a retainer flange projecting outwardly from said rim along one side of said tray, and an upstanding mounting plate on the side of said tray opposite said retainer flange, said mounting plate including an aperture for receiving said first stud for anchoring one of said end plates to said mounting plate;

a retainer bar having an aperture therein for receiving said second stud for anchoring the other of said end plates to said bar;

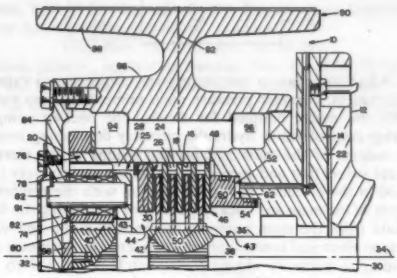
means for securing said retainer bar to said retainer flange such as to hold said pack tightly in said tray; and

means for attaching said support securely to appropriate structural members of said vehicle.

4,317,498
WHEEL DRIVE ASSEMBLY

Norman F. Jirousek, Garfield Heights, and William M. Shipitalo, Novelty, both of Ohio, assignors to Towmotor Corporation, Mentor, Ohio

PCT No. PCT/US80/00720, § 371 Date Jun. 6, 1980, § 102(e) Date Jun. 6, 1980, PCT Pub. No. WO80/02821, PCT Pub. Date Dec. 24, 1980.
Continuation-in-part of Ser. No. 89,125, Jun. 14, 1979, abandoned. This PCT application Jun. 6, 1980, Ser. No. 173,927
Int. Cl.³ B60K *17/04*; F16D *55/40*
U.S. Cl. 180—70 R **16 Claims**



1. A wheel drive assembly (10), comprising:

a spindle (14) having inner and outer surfaces (16,18), a first end (20) and a bore (24) having a first end portion (25), said inner surface (46) having first and second sets (26,28) of inner teeth (30) positioned on said inner surface (16);

a shaft (30) having an end portion (32), a longitudinal axis (34) and an outer surface (36) and being positioned within said bore (24) of said spindle (14) and defining a cavity (44) at said first portion (25) of said bore (24) between said inner surface (16) of said spindle (14) and said outer surface (36) of said shaft (30), said outer surface (36) having first and second sets (38,40) of outer teeth (42) positioned on said outer surface (42);

a brake (46) having a friction disc (46) and a reaction disc (48) and being positioned within said cavity (44), one of said friction and reaction discs (46,48) being positioned in mated relationship with said first set (26) of inner teeth (30), the other of said friction and reaction discs (46,48) being positioned in mated relationship with said first set (38) of outer teeth (42);

a planetary gear assembly (74) having a ring gear (76), planet gears (78) and a planet carrier (82), said planet gears (78) being in mated relationship with said second set (28) of inner teeth (30) and said second set (40) of outer teeth (42), said ring gear (76) being defined by said spindle (14) at said second set (28) of inner teeth (30);

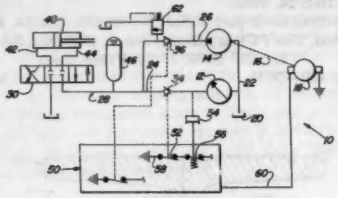
a wheel (90) having a load supporting member (86,88), defining a mid-circumferential plane (92) and being positioned about said spindle (14) and said end portion (32) of said shaft (30); and

first and second bearings (94,96) positioned along and in contact with said outer surface (18) of said spindle (14) and with said load supporting member (86,88) and displaced equal distances from and on opposite sides of said mid-circumferential plane (92) for transferring external forces exerted on said load supporting member (86,88) to said spindle (14).

4,317,499
VEHICLE EMERGENCY STEERING SYSTEM

Wayne R. Miller, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Dec. 26, 1979, Ser. No. 106,531
Int. Cl.³ B62D 5/006
U.S. Cl. 180—133 5 Claims

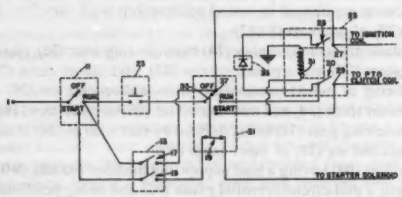


1. A hydraulic power steering system, comprising: a variable displacement, constant pressure main pump; a backup pump; an electric motor coupled for driving the backup pump; a steering control valve; hydraulic circuitry connecting respective outputs of the main and backup pumps to the steering control valve; first and second check valves respectively connected in the circuitry in communication with the respective outputs of the main and backup pumps for preventing the flow of fluid from the main pump to the backup pump and vice-versa; an electrical control circuit connected to the motor and including a normally closed flow switch connected to the hydraulic circuitry in flow-receiving relationship to the main pump and being operative to open in response to flow being outputted by the main pump; said electrical control circuit further including a normally closed pressure switch connected in series with the flow switch to effect energization of said electric motor only upon both switches being closed; said pressure switch being connected in the hydraulic circuitry in fluid communication with the steering control valve and being operative to open in response to the fluid pressure being at a predetermined minimum value for effecting adequate power steering whereby the backup pump will be driven only in the event that the main pump does not ouput any fluid and the pressure is below the predetermined minimum value.

4,317,500
SAFETY START AND SHUTDOWN SYSTEM FOR VEHICLES HAVING ELECTRICALLY ACTIVATED POWER TAKE-OFF

Curtis R. Bening, Burnett, Wis., assignor to Deere & Company, Moline, Ill.

Filed Feb. 22, 1980, Ser. No. 123,500
Int. Cl.³ B60K 27/08
U.S. Cl. 180—273 5 Claims



1. A safety start and shut-down system for a vehicle having an electrically clutched power take-off system, comprising:

(a) first means for providing an electrical current;

(b) an ignition switch having an off, run, and start position selectively engageable, said ignition switch to receive said current;

(c) a double stage open-close switch, said double stage switch to have a first stage in communication with said ignition switch to receive said current from said ignition switch when said ignition switch is in said start position and a second stage in communication with said ignition switch to receive said current from said ignition switch when said ignition switch is in said run position, said double stage switch being in communication with said vehicle's drive system such that both said first and second stages are closed only when said vehicle's drive system is in a neutral mode;

(d) first switch means in communication with and for receiving current from said ignition switch when said ignition switch is in said run position, said switching means to be closed only when a vehicle operator is properly stationed with respect to said vehicle;

(e) first means for conducting said current from said first stage of said double stage switch when said first stage is closed to said vehicle's starter solenoid;

(f) second means for conducting said current from said second stage of said double stage switch when said second stage is closed to said vehicle's ignition coil;

(g) second switching means having an off, run, and start position selectively engageable, in communication with said first switching means for receiving said current from said first switching means when said first switching means is closed, when said second switching means is in said off position said received current to be directed to said second conducting means;

(h) third means for conducting said current from said second switch means when said second switch means is in said start position to said vehicle's power take-off system coil; and

(i) relay means in communication with and for receiving current from said second switch means when said second switch means is in either said start or run position, when said second switch means is in said start position said relay means to be responsive thereto to assume a closed mode, when said second switch means is in said run position said relay to be locked in said closed position to conduct received current to said second means and said third conducting means;

whereby improper stationing of said vehicle operator with respect to said vehicle when said vehicle's drive system is engaged causes said first switching means to open, thereby interrupting the flow of current in said system stopping said vehicle's engine and disengaging said vehicle's PTO system, said system must be reset to reactivate said vehicle and PTO system.

4,317,501
APPARATUS FOR THE PRODUCTION OF SEISMIC SHOCKS

Jacques Gleize, Paris, France, assignor to Compagnine Generale de Geophysique, Massy, France

Division of Ser. No. 849,022, Nov. 7, 1977. This application Aug. 26, 1980, Ser. No. 181,483
Claims priority, application France, Nov. 5, 1976, 76 33455
Int. Cl.³ G01V 1/147
U.S. Cl. 181—121 9 Claims

1. A releasable heavy mass comprising:

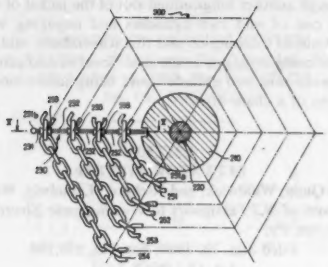
a multiplicity of chain links arranged to form a plurality of chains;

a central mass surrounded by said chains;

a plurality of elastically deformable arms extending out from said central mass and supporting said chains, each arm comprising a central cable engaged with individual chain links in said chains;

a plurality of elastically deformable means on said arms arranged to be maintained under compression between said links engaged with said cables whereby said deformable means tend to restore said arms to a condition of radial extension;

releasable sling means attached to said arms and said mass; and



aerodynamic drag means mounted to said sling means and arranged to maintain said sling means above said central mass during falling of the releasable heavy mass.

4,317,502

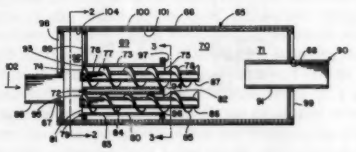
ENGINE EXHAUST MUFFLER

Theodore R. Harris, 14 El Patio, Orinda, Calif. 94563, and Richard T. Harris, 1040 Brown Ave., Lafayette, Calif. 94549

Continuation-in-part of Ser. No. 86,776, Oct. 22, 1979, abandoned. This application Nov. 17, 1980, Ser. No. 207,729

Int. Cl.³ F01N *1/12*

U.S. Cl. 181—280 **10 Claims**



1. An internal combustion engine muffler comprising:

a. an elongated housing having an inlet opening and a rear plate formed with an outlet opening; and including a counter-flow reverberation chamber, a double open ended central chamber extending from said counter-flow chamber to a substantial distance from said rear plate and communicating with said counter flow reverberation chamber and a directional-flow reverberation chamber formed between said rear plate and said central chamber having a closed end and an open end in communication with said central chamber;

b. a first gas flow channeling member including,

(1) an elongated unperforated tubular member having a diameter and a length substantially less than the smallest cross sectional dimension and substantially less than the length of said elongated housing and having an inlet end in communication with said inlet opening of said housing, and an outlet end terminating at the downstream end of said counter-flow reverberating chamber and co-extensive with the upstream end of said central chamber and in communication with said central chamber;

(2) an elongated rod member having a diameter less than the diameter of said elongated tubular member,

(3) a helix member connected to said rod member and having an outer diameter substantially equal to said inside diameter of said elongated tubular member and extending along a substantial portion of said tubular member and extending a substantial distance beyond the downstream end of said tubular member;

c. inflow means connecting said gas flow channeling member to said housing causing substantially all of the exhaust gases from said internal combustion engine to flow through said gas flow channeling member, and said inflow means including a wall forming the upstream end of said counter-flow reverberation chamber; and

d. an outflow tubular member connected to said housing at said outlet opening and extending through said directional-flow reverberating chamber and communicating with said central chamber, and said upstream end of said out flow tubular member is located at the downstream end of said central chamber and the upstream end of said directional-flow reverberating chamber.

4,317,503

SOUND INSULATING BUILDING ELEMENT

Jan Söderquist, Västra Frölunda, and Stefan Einarsson, Lindome, both of Sweden, assignors to Ingemanssons Ingenjorsbyra AB, Gothenburg, Sweden

Filed Nov. 19, 1979, Ser. No. 95,387

Claims priority, application Sweden, Nov. 17, 1978, 7811891

Int. Cl.³ G10K *11/00*; E04B *1/82*; B32B *3/12, 5/08*

U.S. Cl. 181—290 **13 Claims**

1. A sound insulating element comprising:

a first plate element with two main surfaces which is substantially rigid, at least to forces being applied transverse to said two main surfaces, and including a plurality of internal cavities formed therein,

a second substantially rigid plate element which is substantially pervious to air and is connected to one of said two main surfaces of the first plate element,

a third plate element connected to the other surface of said two main surfaces of the first plate element, the second and third plate elements having an E modulus greater than 10^9 N/m^2, and

an impervious substantially rigid fourth plate element extending parallel to and spaced from the second plate element and connected thereto over a minor proportion of its surface area.

4,317,504

TELESCOPIC AERIAL LADDER

Claude Artaud, Challes les Eaux, and Henri Ducruet, Cognin, both of France, assignors to Camiua, Saint-Alban-Leysse, France

Filed Jan. 29, 1980, Ser. No. 116,407

Claims priority, application France, Jan. 30, 1979, 79 02298

Int. Cl.³ E06C *5/04*

U.S. Cl. 182—67 **2 Claims**

1. A telescopic aerial ladder comprising: a plurality of ladder members telescopically coupled together in a manner permitting them to be superposed on one another and extended apart a predetermined amount while remaining coupled together, each said ladder member comprising a pair of trapezoidal lateral guard rail wings interconnected by a plurality of rungs extending between said wings and spaced along the length of said wings, each said wing comprising at least an upper longitudinal upright member and a lower longitudinal upright member interconnected by a lattice structure, the distance between the relative upper and lower longitudinal edges of said wings

continuously increasing from a first end to a second end of each of said ladder members, the second end of an uppermost ladder member being embedded during extension in the first

end of a next lowermost ladder member, said lateral guard rail wings remaining uniformly spaced by said rungs in each said ladder member.

4,317,505

HYDRAULIC APPARATUS FOR THE OPERATION OF AN ELEVATOR

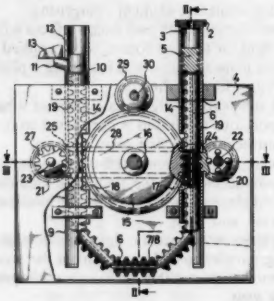
Erich Schneider, Emmelshausen, Fed. Rep. of Germany, assignor to Kombi-Lift Montage- und Handelsgesellschaft mbH, Solingen, Fed. Rep. of Germany

Filed Nov. 6, 1979, Ser. No. 91,907

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1978, 2848541

Int. Cl.³ B66B *11/04*

U.S. Cl. 187—17 **3 Claims**



1. A hydraulic apparatus for the operation of an elevator comprising

(a) a linearly extending hydraulic cylinder having a jacket and a piston guided therein;

(b) load receiving means adapted to move through a predetermined path of motion;

(c) a further linear cylinder arranged adjacent to the hydraulic cylinder, having a jacket and extending in a direction parallel to the path of motion of the load receiving means;

(d) a plurality of pivotally interconnected thrust members having a continuous toothing, arranged downstream of the piston and extending through both cylinders, said cylinder being open at their bottom end and the thrust members depending downwardly at the two cylinders;

(e) a slide member carried by at least one of said thrust members are provided with a support arm with which it passes through a longitudinal slot in the jacket of the further linear cylinder and to which the load receiving means are attached;

(f) a central gear supported rotatably between the two cylinders in passing through longitudinal slots in the cylinder jackets and engaging with the continuous toothing of the thrust members; and

(g) two rotatably mounted external gears, each passing through another longitudinal slot of the jacket of a respective one of said two cylinders and engaging with said continuous toothing of said thrust members, said external gears being arranged at the same level as said central gear between said two cylinders and being interconnected by means of a chain drive.

4,317,506

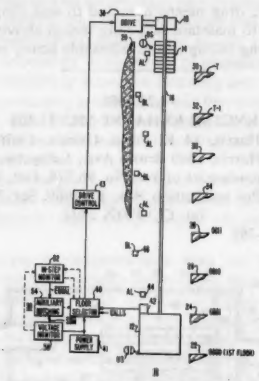
ELEVATOR SYSTEM

Wing C. Quan, Waldwick, and Richard H. Ludwig, West Caldwell, both of N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 10, 1980, Ser. No. 158,106

Int. Cl.³ B66B *5/02*

U.S. Cl. 187—29 R **8 Claims**



1. An elevator system, comprising:

a building having a plurality of floors,

an elevator car mounted for movement in a predetermined travel path in said building to serve the floors therein,

a notching floor selector including a memory element for each floor served by said elevator car,

a power supply for said floor selector,

first and second volatile counter means,

non-volatile memory means responsive to and memorizing the count of said first counter means,

means notching said floor selector and actuating said first and second counter means in response to movement of said elevator car such that said counter means have a count representative of the floor registered in said floor selector,

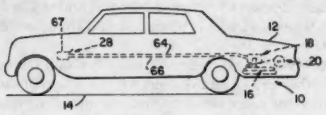
comparator means comparing the memorized count in said non-volatile memory means with the count of said second counter means, said comparator means providing a first signal when the counts match and a second signal when they do not,

and reset means resetting said notching floor selector and at least said second counter means to each represent the same floor at a selected end of the predetermined travel path of said elevator car, in response to said comparator means providing its second signal,

said reset means including auxiliary notching means notching said notching floor selector and actuating said second counter means in a predetermined direction, without movement of the elevator car following reset by said reset means, until said comparator means provides its first signal, indicating that said notching floor selector and said second counter means have been notched and actuated,

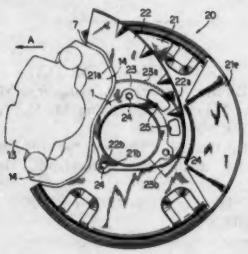
respectively, to represent the floor memorized by said non-volatile memory means.

4,317,507
EMERGENCY BRAKING SYSTEM
Robert E. McMillan, 171 Orange Rd., Montclair, N.J. 07042
Filed Mar. 11, 1980, Ser. No. 129,230
Int. Cl.³ B60T *1/14*
U.S. Cl. 188—5 **16 Claims**



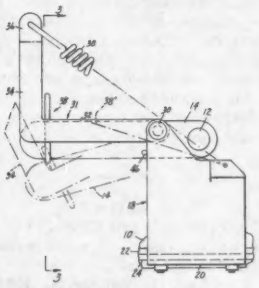
1. An emergency braking system operably associated with a vehicle operated on a road surface comprising:
anchor means releasably carried by said vehicle for adherence to said road surface;
actuation means in said vehicle for releasing said anchor means from said vehicle; and
cable means joining said anchor means to said vehicle for braking the movement of the vehicle when the anchor means is adhered to the road surface, said cable means including a reel rotatably attached to said vehicle for carrying a flexible cable wherein said cable is fixed at one end to said anchor means and at the other end to said reel, frictional control means being associated with said reel to regulate the payout of the cable and thus brake the movement of the vehicle away from the anchor means, said frictional control means including a soft tough material matrix in which the cable is imbedded, whereby the payout of the cable requires the cable to be torn out of the material matrix, said material matrix being of a graded toughness around the reel, with the toughness increasing from the outer periphery of the reel towards the center of the reel, whereby the payout of the cable is at a slower speed as more of the cable is unwound from the reel, so that a relatively smaller deceleration force is encountered when the anchor is first adhered to the road surface.

4,317,508
DISC BRAKE
Masayoshi Katagiri, and Takashi Fujii, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Aisin Seiki Kabushiki Kaisha, both of Aichi, Japan
Filed Feb. 7, 1980, Ser. No. 119,380
Claims priority, application Japan, Feb. 24, 1979, 54-21182
Int. Cl.³ F16D *65/847*
U.S. Cl. 188—218 A **18 Claims**



1. A disc brake comprising:
a ventilated disc rotor having a plurality of air passages running between a pair of friction surfaces thereof from the central part to the outer periphery thereof;
a pair of braking pads disposed on either side of said disc rotor;
a mechanism for urging said pair of braking pads onto the friction surface on either side of said disc rotor;
a stationary support member for supporting said braking pads;
a dust cover for covering said disc rotor to protect said rotor from water and mud, said dust cover being provided with an air introducing hole positioned closer to the center of said disc rotor than to said friction surfaces of said disc rotor;
an air collector disposed on the outer side of said dust cover and having a portion extending outwardly from said dust cover for collecting air flowing outside the dust cover to lead it to said air introducing hole; and
an air guide disposed on the inner side of said dust cover for guiding the air coming from the air introducing hole as far as the plurality of entrances of said air passages in said disc rotor.

4,317,509
TRANSMISSION SAFETY DEVICE
Alan Weisman, 570 Spring St., Richmond, Calif. 94804
Filed Jul. 11, 1980, Ser. No. 168,766
Int. Cl.³ B60K *41/26*
U.S. Cl. 192—4 A **3 Claims**

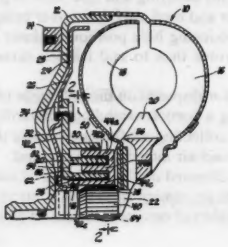


1. In a transmission having a transmission lever adapted to be manually shifted to various positions including "park", "reverse", "neutral" and "drive", means for providing an additional holding force for holding said lever in "park" comprising:
a member pivotally supported relative to said transmission and formed to provide a pair of spaced apart abutments,
one of said abutments adapted to be engaged by said lever as said lever is moved in one direction from "reverse" position to "park" position for swinging said member about its pivot from a first position to a second position,
spring means fixedly secured at one end relative to said transmission and connected at its other end to said member,
the line of action of said spring means moving from one side of the pivot of said member to the opposite side of the pivot upon movement of said member between said first and second positions,
the other of said abutments being positioned to engage said lever for urging it in said one direction under the urgency of said spring means when said member is in said second position.

4,317,510
TORQUE CONVERTER CLUTCH HAVING A VISCOUS DRIVE PORTION

Vincent M. Staub, Jr., Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 24, 1980, Ser. No. 171,754
Int. Cl.[3] F16D *47/06, 33/00, 35/00*
U.S. Cl. 192—48.3 2 Claims

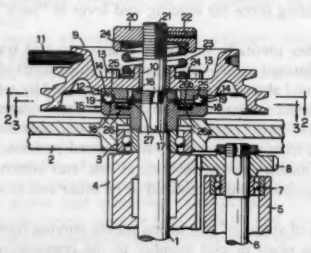


1. A viscous clutch comprising; an input member having friction means for frictionally engaging a rotary power source, a disc supporting said friction means and a plurality of hollow cylindrical input hub members extending axially from said disc; an output member having shaft means for delivering power from said viscous clutch, a radially extending flange portion secured to said shaft means, and a plurality of hollow cylindrical output hub members extending axially from said flange portion and being disposed circumjacent respective input hub members providing an interdigitaled relation therewith; and a viscous fluid in communication with said hub members, said plurality of input hub members having helical grooves formed on the axially extending radially inner and radially outer cylindrical surfaces thereof which cooperate with the adjacent axially extending cylindrical output hub surfaces so that upon relative rotation between said input and output members a pumping action is created between said hub members to pressurize the fluid therebetween and viscously transmit rotary drive from said input hub members to said output hub members.

4,317,511
OVERLOAD RELEASE CLUTCH

Tatushi Asai, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Mar. 11, 1980, Ser. No. 129,981
Claims priority, application Japan, Mar. 26, 1979, 54-36131
Int. Cl.[3] F16D *43/20*
U.S. Cl. 192—56 R 9 Claims

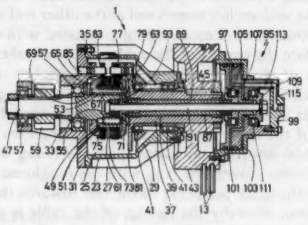


1. An overload release clutch comprising:
a driving clutch member and a driven clutch member mounted on a frame for rotating about a common axis,
pressing means for pressing either one of the two clutch members toward the other clutch member,
at least one torque transmitting ball interposed between said clutch members,
at least one opening formed for receiving said ball on each mutually confronting inside surface of said clutch members,
at least one ball guiding slot formed on the inside surface of either one of said clutch members, said slot being nearly circumferentially extended from one end communicated with said opening to the other end so as to gradually change the distance thereof from said common axis, and
a rotatable member rotatably disposed on the other of said clutch members for being engaged and rotated with said ball when said ball is placed at said the other end of said slot,
whereby when said ball is moved from said opening to said the other end of said slot against the action of said pressing means by more than a predetermined torque possibly applied to said driven clutch member, said ball is integrally rotated with said rotatable member with no sliding.

4,317,512
MULTIPLE-DISK CLUTCHES

Tadashi Sato, Atsugi, Japan, assignor to Amada Company, Limited, Isehara, Japan

Filed Jul. 1, 1980, Ser. No. 165,064
Claims priority, application Japan, Jul. 2, 1979, 54-82704
Int. Cl.[3] F16D *25/063;* B60K *41/24*
U.S. Cl. 192—85 AA 4 Claims



1. A multiple-disk clutch, comprising:
an input shaft;
an output shaft;
clutch means for engaging and disengaging the power between the input shaft and the output shaft;
first rod means for moving the clutch means into and out of power engagement, said first rod means pushing the output shaft in the same direction in which the clutch is moved for power engagement; and
second rod means for moving the output shaft in the opposite direction of the first rod means so as to cancel the thrust force caused by the first rod means moving in the direction in which the clutch means is moved for power engagement.

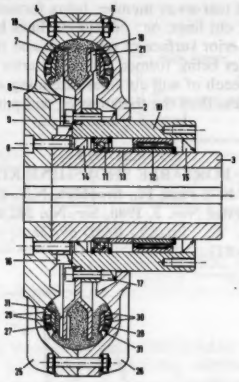
4,317,513
CENTRIFUGAL CLUTCH

Koning Wiebe, Zwolle, Netherlands, assignor to Machinefabriek en Technische Handelsonderneming M. H. Van Der Graaf BV, Vollenhove, Netherlands

Filed Dec. 26, 1979, Ser. No. 106,528
Claims priority, application Netherlands, Dec. 28, 1978, 7812622
Int. Cl.[3] F16D *43/284, 35/00*
U.S. Cl. 192—105 A 10 Claims

1. A centrifugal powder clutch comprising
a housing fixedly connected to a driving shaft,
a rotor, mounted for rotation in said housing and fixedly connected to a shaft to be driven,
said rotor having an open channel-shaped circumferential

groove confined between two ring-shaped walls of the rotor, said walls being situated on opposite sides of the median rotor plane,



each wall being provided with at least one passage, each passage being arranged at an acute angle with the rotor median plane,

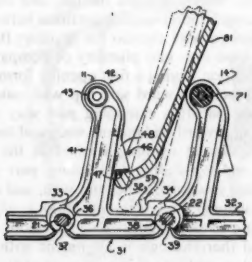
the entrance of each passage being obliquely oriented relative to such plane.

4,317,514

TRAY LOCK CONVEYOR FOR DISHWASHING MACHINES

Tore H. Noren, P.O. Box 219, Petaluma, Calif. 94952

Filed Apr. 7, 1980, Ser. No. 137,571
Int. Cl.³ B65G *49/02*
U.S. Cl. 198—649 **1 Claim**



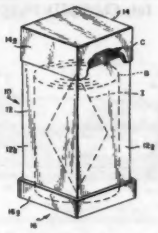
1. In an endless conveyor belt moving wares such as trays through a dishwashing machine, a plurality of peg links disposed on transverse rods with each link having a longitudinal body portion and a single upstanding peg with a front and back side and a tray lock on the back side of said peg including a projection having a substantially horizontal undersurface disposed in spaced relation above said body portion, each of said peg links having front and rear transverse bearings for mounting upon transverse rods of said conveyor belt with said body portion extending between said bearings and said peg extending upwardly from said body adjacent said front bearing, and said body having a short upstanding shoulder adjacent said rear bearing below said tray lock projection to define with said peg an area for engagement by an edge of a tray or the like disposed between said peg and like pegs on peg links in a row behind said peg link.

4,317,515

GAME PACKAGE

Ruth E. Feeley, and John M. Feeley, both of 19333 Plummer St., Northridge, Calif. 91324

Filed Aug. 12, 1980, Ser. No. 177,479
Int. Cl.³ A63F *3/00*; B65D *85/54*
U.S. Cl. 206—315 R **18 Claims**



17. A game package comprising

A. an elongated tubular carton body having a selected cross-sectional shape, a closed end and an open end;

B. a plurality of game pieces having substantially the same shape and dimensions as said carton body cross-section so that said game pieces can be stacked in register with the open end of the carton body; and

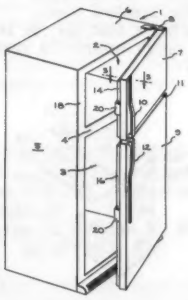
C. a removable cover having approximately the same shape and dimensions as the carton body cross-section at said open end, said cover having side walls extending around the perimeter of the cover, the height of the side walls being appreciably greater than the height of the stack of game pieces in register with the carton body open end so that the cover can be engaged over the game pieces and the carton body open end to protectively enclose the game pieces and the carton body.

4,317,516

DEVICE AND METHOD FOR SHIPPING APPLIANCES

Marion H. Palmer-Ball, Sr., Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Mar. 3, 1980, Ser. No. 126,596
Int. Cl.³ E05B *65/52*
U.S. Cl. 206—320 **16 Claims**



1. In an appliance having a cabinet with a hinged door and a sealing gasket therebetween, a shipping device comprising:

a spacer member positioned adjacent the sealing gasket, said member having a u-shaped body as viewed in lateral cross section and having two spaced legs joined by a spanning portion, said legs providing two flat surfaces, each having an adhesive coating, one said adhesive coating being in

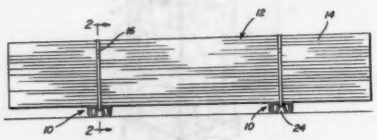
contact with the door and the other in contact with the cabinet.

4,317,517

LAMINATED PAPER LOAD SPACER AND SUPPORT

Lucien E. Tisdale, Monroe, La., assignor to Fiber Tech, Inc., Monroe, La.

Filed Feb. 8, 1980, Ser. No. 119,827
Int. Cl.³ B65D *19/00*
U.S. Cl. 206—597 **2 Claims**



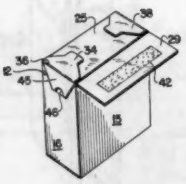
1. A load support, spacer, batten or the like comprising an elongated continuous member constructed of laminated paperboard and adhesive to form a substantially rigid member, said member being generally of W-shape and including a pair of generally parallel, hollow load cells, each of said load cells being defined by an inner wall and an outer wall, a narrow wall connecting the outer edge portions of the inner and outer walls of each cell, a narrow wall connecting the inner edge portions of the inner walls of the pair of cells for stabilizing the load cells while leaving the space included between the outer portions of the inner walls of the pair of cells free of obstructions thereby defining a continuous laterally opening slot defined on three sides by the inner walls and the narrow wall connecting the inner edge portions of the inner walls with the fourth side being open and free of any connecting structure throughout its length, both said narrow walls being a continuation of the laminated paper board and adhesive of the sidewalls thereby forming a substantially rigid member of W-shape cross-sectional configuration and a continuous connecting panel overlying both of the load cells and being connected to the outer walls and the narrow wall connecting the inner edge portions of the inner wall.

4,317,518

CARTON WITH RECLOSABLE SPOUT AND BLANK THEREFOR

Duane R. Mode, Edina, Minn., assignor to Champion International Corporation, Stamford, Conn.

Filed Sep. 4, 1980, Ser. No. 184,092
Int. Cl.³ B65D *5/74, 5/70*
U.S. Cl. 206—626 **14 Claims**



1. A carton formed of paperboard having a reclosable spout comprising:

a plurality of panels hingedly coupled along fold lines and arranged as a closed tubular body,

one of said panels including

a main spout member and a secondary spout member,

said main spout member being defined by a first fold line, first and second tear-away members extending from said first fold line and a third tear-away member interconnecting said first and second tear-away members,

said secondary spout member being defined by a second fold line and said third tear-away member,

said third tear-away member being formed from a pair of spaced cut lines, one of said cut lines being formed on the exterior surface of said panel and the other of said cut lines being formed on the interior surface of said panel, each of said cut lines extending a depth into said panel less than the thickness of said panel.

4,317,519

PORTABLE SHOESHINE KIT

Leroy Talley, 1078 Park Pl., Brooklyn, N.Y. 11213

Filed Nov. 3, 1980, Ser. No. 202,928
Int. Cl.³ B65D *69/00*
U.S. Cl. 206—577 **8 Claims**

1. A portable shoeshine kit for use at different locations, comprising a travelling case having a bottom wall, a pair of side walls, a pair of end walls, and a top wall, said top wall having a pivotted cover for flush engagement with the top of a side wall, said travelling case defining therein at least one compartment for storing articles therein; said travelling case further comprising an intermediate partition between said pair of side walls and parallel thereto for dividing the interior of said travelling case into said plurality of compartments, said intermediate partition having a first opening formed in the top surface thereof facing toward said top wall, said opening in said intermediate partition extending part way through said intermediate wall toward said bottom wall; and one of said side walls having a second opening formed in the top surface thereof facing said top wall and extending part way through said one side wall toward said bottom wall; and said top wall having a third opening formed therethrough in alignment with said first opening of said intermediate partition, and a fourth opening formed therethrough in alignment with said second opening formed in said one side wall; and chair means upon which a person may sit, said chair means being mountable in said openings.

4,317,520

SERVO SYSTEM TO CONTROL THE SPATIAL POSITION OF DROPLET FORMATION OF A FLUID JET IN A CELL SORTING APPARATUS

Igino Lombardo, Sharon, and Richard A. Dussault, Attleboro, both of Mass., assignors to Ortho Diagnostics, Inc., Raritan, N.J.

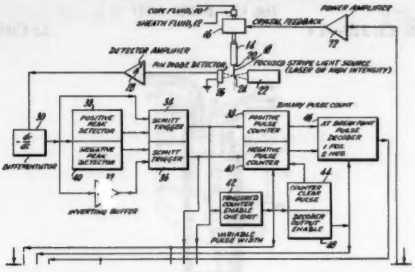
Filed Aug. 20, 1979, Ser. No. 68,112
Int. Cl.³ B07C *5/342*
U.S. Cl. 209—3.1 **29 Claims**

1. A method of detecting at least the breakpoint region of a perturbed flow stream, comprising:

(a) measuring at least the scattering of light caused by said perturbed stream at a preselected flow stream sensing

point therealong to produce a real time waveform proportional thereto;

(b) differentiating said real time waveform to produce a differentiated waveform;



(c) selectively monitoring said differentiated waveform to distinguish a waveform exhibiting substantially three, positive and negative peaks per cycle, whereby detection of said three peaks per cycle indicates that said breakpoint region of said flow stream corresponds with said flow stream sensing point.

4,317,521

APPARATUS AND METHOD FOR SORTING ARTICLES

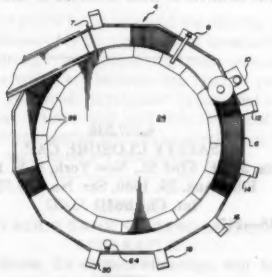
Reginald H. Clark; John D. MacArthur; Michael Sayer, all of Kingston, and William D. Wilder, Ottawa, all of Canada, assignors to Resource Recovery Limited, Ottawa, Canada

Continuation of Ser. No. 940,256, Sep. 7, 1978, abandoned. This application Aug. 14, 1980, Ser. No. 178,094

Claims priority, application Canada, Sep. 9, 1977, 286567

Int. Cl.³ B07C 5/34

U.S. Cl. 209—558 **19 Claims**



1. Conveyor apparatus for sorting articles including:

(a) a conveyor constructed of key members extending transversely thereacross with a gap between each pair of members

(b) feeding means to feed the articles on to said conveyor,

(c) detector means located adjacent said conveyor to examine each article to determine at least one characteristic thereof and provide a corresponding identifying signal,

(d) means to determine the length of each article as determined by the plurality of key members supporting it,

(e) a reference unit positioned at a fixed location in relation to the conveyor whereby the position of each article travelling along the conveyor can be measured therefrom as a function of the number of key members from the article to said reference unit, and

(f) control means for utilizing each respective corresponding identifying signal to select one of a plurality of paths and move a respective said plurality of key members from a supporting to a non-supporting position whereby each article is fed along a selected path in dependence on said at least one characteristic of the respective article.

4,317,522

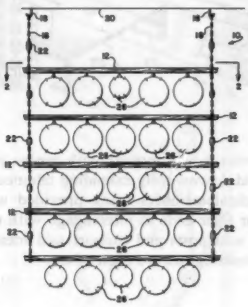
SUSPENDED PLATE DISPLAY SYSTEM

June P. Garrett, 3061 Southdale Dr., Dayton, Ohio 45409

Filed Dec. 3, 1979, Ser. No. 99,269

Int. Cl.³ A47F 5/08

U.S. Cl. 211—113 **1 Claim**



1. In combination with a plurality of individual plates each having individual plate hangers attached thereto to hanging said plates in vertically spaced, horizontal rows of plates for display purposes, a suspended plate display system comprising:

a plurality of elongated, narrow shelves,

said shelves being disposed in vertically spaced, substantially parallel, horizontal planes,

pairs of openings formed in opposite ends of each of said shelves,

double lengths of chains extending through said pairs of openings, looped around opposite longitudinal edges of said shelves and back through said openings to fix and suspend said shelves in said spaced parallel relationship to each other.

hollow beads positioned between adjacent shelves,

said double lengths of chains passing through said hollow beads whereby said double lengths of chains are drawn together by said hollow beads intermediate said adjacent shelves to enhance the stability of said system, and

a plurality of hooks projecting from lower surfaces of said shelves, each of said hooks engaging an individual one of said plate hangers and hanging a plurality of said plates beneath each of said shelves for displaying said plates as horizontally arranged vertically spaced rows of plates.

4,317,523

STORAGE STRUCTURE HAVING TWO-PIECE BEAMS

Anthony N. Konstant, Mount Prospect, and John J. Weider, Arlington Heights, both of Ill., assignors to Speedshelf International, Inc., Skokie, Ill.

Filed Oct. 12, 1979, Ser. No. 83,867

Int. Cl.³ A47F 5/00

U.S. Cl. 211—187 **13 Claims**

1. A beam for use in a rack framework to interconnect two vertical posts, which posts are provided with means in opposite surfaces thereof for engagement with said beam, said beam comprising

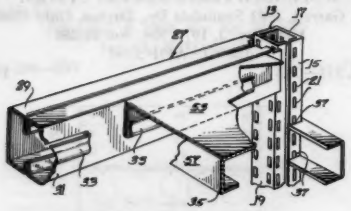
first and second longitudinally extending channel members each having a vertical web and horizontal upper and lower flanges

at least a portion of the lower flange of said first longitudinal member being bent upward to create upwardly extending tab means and the lower flange of said second longitudinal

member being formed with means proportioned to receive said tab means,

at least a portion of the upper flange of said second longitudinal member being bent downward to create downwardly extending tab means and the upper flange of said first longitudinal member being formed with means proportioned to receive said downwardly extending tab means,

said longitudinal members being provided with connecting means near their ends to interengage with the engagement means on said posts and support said members with said flanges extending toward each other.



4,317,524

HYDRAULIC CRANES

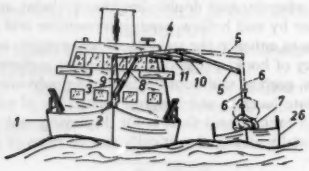
Lars Y. Andersson, Forsa, Sweden, assignor to Hiab-Foco Aktiebolag, Sweden

Filed Mar. 10, 1980, Ser. No. 128,460

Claims priority, application Sweden, Apr. 2, 1979, 7902895

Int. Cl.³ B66C *13/04*

U.S. Cl. 212—146 **8 Claims**



1. An improved hydraulic crane, comprising a crane post, a lifting arm journalled on said crane post, a lifting cylinder arranged to pivot said lifting arm in a vertical plane, a hydraulic pump, said cylinder connected to said hydraulic pump via a first hydraulic line, a hand valve inserted in said hydraulic line, and a dampening accumulator connected to said first hydraulic line via a second hydraulic line, the improvement comprising

a non-return valve inserted in said second hydraulic line connecting said accumulator to said first hydraulic line, said non-return valve allowing flow of pressurized fluid only in the direction away from said lifting cylinder, and a drainage line, said drainage line connected to said accumulator, a pressure-limiting valve inserted in said drainage line and arranged to open in response to a temporary excess pressure in said accumulator for relief of pressure to said drainage line.

4,317,525

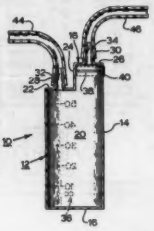
DISPOSABLE BODY FLUID COLLECTION DEVICE

Thomas F. Schuessler, Hillsboro, and Douglas K. Melville, Bridgeton, both of Mo., assignors to Sherwood Medical Industries Inc., St. Louis, Mo.

Filed Jun. 5, 1980, Ser. No. 156,711

Int. Cl.³ B65D *1/00*

U.S. Cl. 215—1 C **23 Claims**



1. A body fluid collection device comprising a container having a bottom end wall, a sidewall, and an upper portion including an upper end wall integrally connected with said sidewall, said bottom end wall, sidewall and upper portion defining a collector chamber for receiving body fluid, a pair of spaced tube connectors integrally connected to said upper portion of said container in fluid communication with said chamber and adapted to receive in sealing connection therewith a pair of tubes adapted for respective connection to a source of body fluid and a source of vacuum for collecting body fluid in said chamber, and a line of weakness in said upper portion of said container, a first part of said container on one side of said line of weakness being manually movable away from an adjacent second part of said container on the opposite side of said line of weakness to form an opening in said container for the removal of fluid collected in said chamber.

4,317,526

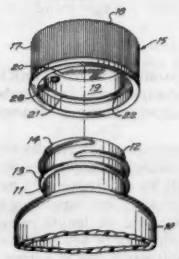
SAFETY CLOSURE CAP

Gernot Plitz, 310 E. 52nd St., New York, N.Y. 10022

Filed Aug. 29, 1980, Ser. No. 182,733

Int. Cl.³ B65D *55/02*

U.S. Cl. 215—217 **7 Claims**



1. A safety closure cap comprising a top cover, a generally cylindrical skirt member downwardly extending from said top cover, and an arcuate lip carried on the interior surface of said skirt, said lip having a leading and trailing edge in close proximity to each other.

4,317,527
KNOCK-DOWN ICE CHEST

Lawrence R. Belleville, 6061 Hickory La., Washington, Mich. 48094

Filed Sep. 29, 1980, Ser. No. 191,542
Int. Cl.³ B65D 6/24, 81/38
U.S. Cl. 220—4 F 3 Claims

1. A knock-down ice chest assembly comprising:

a plurality of separate insulated panels, each panel including a base assembly with an exterior metal covering mounted to one side of said base assembly and an interior insulating metal covering mounted to the opposed side of said base assembly;

said base assembly including a pair of rectangular frames mounted together in a parallel side-by-side fashion with one of said rectangular frames having a larger exterior perimeter than the other rectangular frame;

said exterior metal covering being in the shape of an open box and said exterior metal covering being mounted to the exterior perimeter of the larger rectangular frame, said interior insulating metal covering being in the shape of an open box and said interior metal covering being mounted to the exterior perimeter of the smaller rectangular frame;

said rectangular frames and metal coverings forming a closed box-like structure and foam plastic filling the space between said metal coverings to form an insulated panel; and

said insulated panels being mounted together for easy assembly and disassembly by a plurality of detachable fasteners passing through the exposed edge areas on said rectangular frames which are between the exterior perimeters of the large and small rectangular frames, and said smaller rectangular frames and said interior metal coverings tightly fitting together to form an interior box for holding ice when said panels are assembled.

4,317,528
FLOATING ROOF TANK SEALING METHODS AND APPARATUS

Fredrick O. Swain, La Canada-Flintridge, and Raymond E. Decker, Riverside, both of Calif., assignors to Mesa Industries, Inc., Monrovia, Calif.

Filed Aug. 21, 1979, Ser. No. 68,856
Int. Cl.³ B65D 88/46
U.S. Cl. 220—224 15 Claims

1. In a method of preventing vapor from escaping from a storage tank through an annular space of varying width between a floating roof in, and a wall of, said tank, the improvement comprising in combination the steps of:

closing said annular space with a corresponding annular flexible seal extending in said tank from said floating roof to an outer circumference at said wall for a width larger than the largest extent of said varying width;

curving said seal around said floating roof and between said floating roof and said wall;

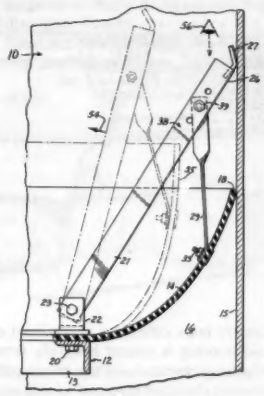
applying to the curved seal at intervals spaced about said floating roof a series of forces each acting on said curved seal at a first distance from said outer circumference at said wall and at a second distance from said floating roof greater than said first distance;

varying said forces in response to fluctuations of said varying width; and

reversing said forces by applying a lifting force in response to diminution of said varying width.

7. Sealing apparatus for preventing vapor from escaping from a storage tank through an annular space of varying width between a floating roof in, and a wall of, said tank, the improvement comprising in combination:

means for closing said annular space including a corresponding annular flexible seal of a width larger than the largest extent of said varying width;



means for curving said seal around said floating roof and between said floating roof and said wall, including means for mounting said seal of larger width on said floating roof to extend in said tank from said floating roof to an outer circumference at said wall;

means for suspending the curved seal in said tank including a series of suspension devices coupled to said floating roof and riding along said wall; and

means coupled to said curved seal for selectively lifting said suspension devices off said wall in response to diminution of said varying width.

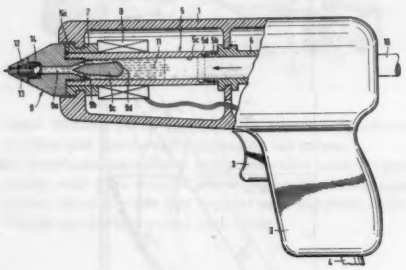
4,317,529
DEVICE FOR THE MELTING AND THE DOSE DISCHARGE OF THERMOPLASTIC MATERIAL

Erich Leibhard, Munich, Fed. Rep. of Germany, assignor to Hilti Aktiengeselischaft, Schaan, Liechtenstein

Filed Jul. 19, 1979, Ser. No. 59,234
Claims priority, application Fed. Rep. of Germany, Jul. 26, 1978, 2832805
Int. Cl.³ B67D 5/62
U.S. Cl. 222—146 HE 8 Claims

1. Device for the melting and the dose discharge of thermoplastic material comprising a housing having a front end and a rear end, an axially elongated melting chamber for melting a thermoplastic material in solid rod form located within said housing and having the axial length dimension thereof extending rectilinearly in the front end-rear end direction of said housing, said melting chamber having a discharge end located adjacent to the front end of said housing and an inlet end located toward the rear end of said housing more remote from the front end, a heating element for melting the thermoplastic material is located around and extends in the axial length dimension of said melting chamber at least adjacent the discharge end of said melting chamber, a closure member located at the discharge end of said melting chamber and said closure member forming an openable closure of the discharge end of said melting chamber, said closure member forming a plurality of discharge openings for the molten material flowing from the

discharge end of said melting chamber, and a displacement body located in said melting chamber, wherein the improvement comprises that said displacement body is formed integrally with said closure member at the discharge end of said melting chamber and extends in the front end-rear end direction of said housing from the discharge end toward the inlet end of said melting chamber for a length of approximately one-third the axial length dimension of said melting chamber with at least a portion of said displacement body located within the range of said heating element extending in the direction of the axial length dimension of said melting chamber, the surface



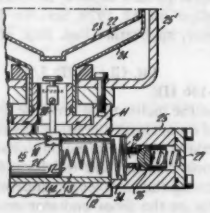
of said displacement body extending in the front end-rear end direction of said housing is spaced inwardly from the inside surface of said melting chamber and tapers conically inward in the direction toward the discharge end of said melting chamber, and the inside surface of said melting chamber from the inlet end thereof to the discharge end tapers conically inwardly with the tapering ratio of said displacement body being significantly greater than the tapering ratio of the inside surface of said melting chamber so that the surface of said displacement body and the inside surface of said melting chamber are in diverging relationship in the direction approaching the discharge end of said melting chamber.

4,317,530

PISTON OPERATED PUMP FOR VISCOUS MATERIALS

Joseph M. Magrath, McCook, Nebr., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 31, 1979, Ser. No. 108,934
Int. Cl.³ B67D *5/02*
U.S. Cl. 222—309 **1 Claim**



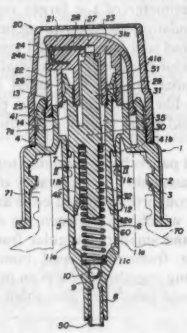
1. In a paste dispensing pump comprising:
(a) a cylindrical chamber with an outlet at one end and an inlet through the side of the cylindrical chamber a fixed distance away from the outlet;
(b) a piston, slidably mounted within the cylindrical chamber and normally at rest at a position which is a greater distance away from the outlet than is the inlet;
(c) means for slidably moving the piston from its position of rest towards the outlet all or part or such distance;
(d) a reservoir of relatively viscous paste material connected to said inlet;
(e) a check value connected to said outlet whereby said viscous material is allowed to exit the cylindrical chamber upon the operation of the slidable piston but material is not allowed to return to said cylindrical chamber through said outlet; the improvement comprising a truncated conical spring mounted inside the cylindrical chamber arranged such that the larger, diameter end of the spring is at the outlet of the cylindrical chamber and the smaller diameter end of the conical spring is closest to the piston and the maximum diameter of said spring is substantially the same as the diameter of said cylinder, the length of said spring is substantially the same as the maximum length of travel of the piston and the spring is compressible into a substantially flat shape by the operation of a full stroke of said piston, whereby said spring is compressed by the action of said piston and whereby the compressing action of such spring prevents the accumulation of air bubbles within such paste when said piston travels less than its full length of travel.

4,317,531

ACCUMULATOR TYPE MANUAL ATOMIZER

Tadao Saito; Takao Kishi, and Yoshiyuki Kakuta, all of Tokyo, Japan, assignors to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Filed Jun. 12, 1980, Ser. No. 158,906
Claims priority, application Japan, Jun. 28, 1979, 54-88980[U]
Int. Cl.³ F04B *9/14, 21/04;* **B05B** *11/00*
U.S. Cl. 222—321 **8 Claims**



1. A liquid spraying device comprising;
a container for liquid,
an atomizer body having an engaging peripheral portion engaged with the neck portion of said container and holding a main cylindrical guide portion formed at the lower portion thereof with a lower small-diameter hollow cylindrical guide portion via a radially inwardly extending flange-like upper wall projected from the upper end of the engaging peripheral portion,
An atomizer head formed with a nozzle hole perforated at a nozzle body detachably inserted thereto to depend a peripheral wall integrally from the peripheral edge of a top wall thereof and having a large-diameter cylinder depending integrally from the top wall inside the peripheral wall thereof so that a cylindrical protruded guide integrally projected from the top wall of said atomizer body is telescoped in the gap between the peripheral wall and the large-diameter cylinder, perforated with an exhaust valve hole at the center of the top wall thereof and formed with an exhaust passage at the top wall of said atomizer head to communicate the liquid from the exhaust valve hole with the nozzle hole of said nozzle body,
an engaging and piston member having a large-diameter rod

portion elevationally movably inserted into a small-diameter cylindrical guide integrally depending from the top wall of said atomizer head with a conical valve body projected at the top thereof for forming an exhaust valve together with the exhaust valve hole of the large-diameter cylinder of said atomizer head, a small-diameter rod portion formed at the lower portion thereof, an upper half tubular portion protruded upwardly outwardly from the lower portion of the large-diameter rod portion thereof, a lower half tubular portion protruded downwardly outwardly from the lower portion of the large-diameter rod portion thereof so that the upper half tubular portion is formed with an upper skirt-like large-diameter piston slidably inserted into the large-diameter cylinder of said atomizer head at the upper end of the outer periphery thereof and is also formed with an intermediate skirt-like intermediate-diameter piston slidably inserted into the cylindrical guide portion of said atomizer body at the lower end of the outer periphery thereof, and a lower skirt-like small-diameter piston slidably inserted into the small-diameter cylindrical portion of said atomizer body at the lower outer periphery of the lower half tubular portion thereof, one liquid passage perforated therethrough with a gap formed between the large-diameter rod portion and the small-diameter cylindrical guide portion to communicate the small-diameter cylindrical portion with the exhaust valve hole of said atomizer head,

a suction tube engaged at the upper end thereof with the engaging cylindrical portion of said atomizer body in a manner to depend downwardly from the cylindrical portion of said atomizer body for intaking the liquid in said container, and

a spring means arranged between the bottom face of the small-diameter cylindrical portion and the upper bottom face formed between the small-diameter rod portion thereof and the lower half tubular portion thereof in such a manner for always urging upwardly said engaging and piston member and said atomizer head strongly,

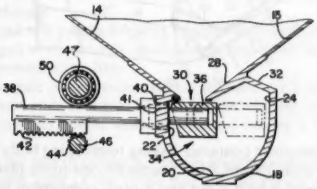
said atomizer body having a suction valve hole provided at the inside bottom of said small-diameter cylindrical portion together with a ball valve.

4,317,532

PNEUMATIC DISCHARGE ARRANGEMENT

Phillip Przybylinski, Shererville, Ind., assignor to Pullman Incorporated, Chicago, Ill.

Filed Oct. 29, 1979, Ser. No. 88,877
Int. Cl.³ B65D *28/72, 90/58*
U.S. Cl. 222—505 **17 Claims**



7. An improved valve arrangement for use in pneumatic hopper discharging structures having an opening, and a trough communicating with said opening, comprising a valve member disposed for movement in a generally horizontal plane below said opening within said trough, and being coextensive with said opening,

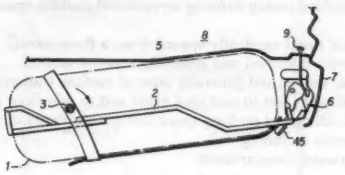
means for supporting said valve member including generally parallel rod members located in a generally horizontal plane beneath said opening, said rod members being mounted for transverse sliding movement and pivotally connected to opposite ends of the valve member and means for independently driving said rod members to effect independent, generally horizontal, movement of the opposite ends of the valve member.

4,317,533

RETAINING AND LOCKING ARRANGEMENT FOR SPARE TIRE CRADLE

Michel Barre, Chaville, and Jean P. Carrion, Courbevoie, both of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Jan. 30, 1979, Ser. No. 7,781
Claims priority, application France, Jan. 30, 1978, 78 02471
Int. Cl.³ B62D *43/04*
U.S. Cl. 224—42.21 **5 Claims**



1. A retaining and locking apparatus for a spare tire cradle which is mounted so as to pivot under the floor of an automobile, said cradle being releasable from the interior of said automobile by means of a manual pull-knob connected to said apparatus, said apparatus comprising:

a housing adapted to be mounted below said automobile floor and adjacent said cradle, said housing defining first and second axes and a first recess adapted to hold a portion of said cradle;

a cradle retaining catch pivotally mounted on said first axis, said cradle retaining catch including a second recess defining a first ramp portion, an elongated manual release tab extending beyond said housing and a first stepped portion, said cradle retaining catch being pivotable to a first position wherein said first and second recesses are coincident;

first biasing means for biasing said cradle retaining catch away from said first position;

a supplementary safety catch pivotally mounted on said second axis, said safety catch being connected to said pull-knob and including an elongated beak portion defining a third recess and a second ramp portion, said safety catch being pivotable to a first position wherein said third recess is coincident with said first and second recesses and wherein said second ramp portion is coincident with a portion of said first recess;

second biasing means for biasing said safety catch into said first position;

lever means pivotally mounted on said second axis and including a second stepped portion engageable with said first stepped portion when said cradle retaining catch is in said first position to form a step catch; and

release means associated with said lever means and said safety catch for releasing said step catch when said safety catch is moved from said first position;

whereby movement of said safety catch upon being acted on by said pull-knob, releases said step catch to release said cradle retaining catch from said first position, and wherein movement of said portion of said cradle into said first recess acts upon said first and second ramp portions to actuate said step catch and lock said cradle.

4,317,534

LUGGAGE CARRIER

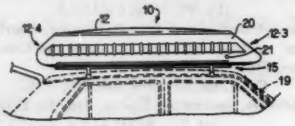
Franklin S. Louw, P.O. Box 116, Bedfordview 2008, South Africa

Filed Aug. 29, 1980, Ser. No. 182,729

Claims priority, application South Africa, Sep. 6, 1979, 79/4721

Int. Cl.³ G60R 9/12; B60R 9/04

U.S. Cl. 224—328 **2 Claims**



1. A luggage carrier for use on the top of a vehicle comprising a molded casing defining an enclosed packing space including

a roof panel vertically spaced from a floor panel,

a forward shaped and generally tapered section,

a rear shaped and generally tapered section, transverse vertical walls fast to said roof panel and to said floor panel for dividing said packing space into a multiplicity of compartments including

a forward compartment,

a rear compartment and

an intermediate compartment, an open-ended groove formed in one side of said roof panel an open-ended groove formed in the corresponding side of said floor panel,

laterally spaced side panels having ends

shaped to correspond to the sides of said

forward and rear sections, at least one of said side panels being slidably mounted between said open-ended grooves to provide access to said packing space, whereby the slidable panel may be moved rearwardly, in said open-ended grooves, to expose and provide access from the side to the forward compartment or the forward and intermediate compartments and also may be moved forwardly to provide access from the side to the rear compartment or the rear compartment and the intermediate compartments.

4,317,535

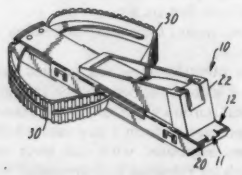
STAPLER WITH TAPERED ANVIL

Terrance D. Huftel, Hudson Township, St. Croix County, Wis.; Lester B. Odegaard, Afton, Minn., and Thomas K. Rasmussen, Roberts, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 15, 1980, Ser. No. 149,901

Int. Cl.³ B25C 5/04

U.S. Cl. 227—19 **3 Claims**



1. In a stapler adapted to bend a generally U-shaped staple having a central portion and a leg projecting from each end of said central portion into a generally rectangular closed shape by bending two predetermined spaced parts of the central portion, said stapler comprising:

a housing having a passageway with an outlet opening, said passageway being partially defined by a planar guide surface;

an anvil fixed to said housing and projecting from said guide surface across said passageway at said outlet opening, said anvil having surfaces disposed generally at right angles to said guide surface including opposite edge surfaces spaced at a distance corresponding to the distance between said predetermined spaced parts and a contact surface transverse of said passageway between said edge surfaces and adapted to engage the central portion of a said staple;

means for positioning a said stable at said anvil with the central portion extending across said contact surface and the predetermined parts along the central portion at said edge surfaces, and the legs projecting along said edge surfaces and said guide surface;

a ram having a top side surface positioned along said guide surface, and spaced tip portions with a generally U-shaped opening therebetween defined by end surfaces disposed in a U-shaped pattern and generally at right angles to said guide surface, said end surfaces including an innermost surface generally parallel and opposed to said contact surface and opposed side surfaces generally parallel to said edge surfaces and spaced apart a distance exceeding the distance between said edge surfaces by about twice the thickness of the central portion of a said staple, said ram being mounted on said housing for movement from a first position affording positioning a said staple along said guide surface, to a second formed position with the side surfaces of said ram opposite the edge surfaces of said anvil to bend the staple closed around said anvil, the improvement wherein:

said edge surfaces of said anvil adjacent said guide surface each are disposed at an acute included angle of no less than 80 degrees with respect to said guide surface so that a said staple being bent around said anvil by said ram will remain generally in alignment with said guide surface until the staple is closed.

4,317,536

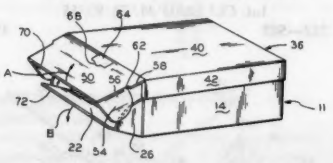
TWO-PIECE CONTAINER

Robert B. Dickerson, Winston-Salem, N.C., assignor to Container Corporation of America, Chicago, Ill.

Filed Oct. 28, 1980, Ser. No. 201,497

Int. Cl.³ B65D 5/22, 5/72, 5/35, 5/66

U.S. Cl. 229—34 R **4 Claims**



1. A two-piece container having telescoping body and cover member each formed from a separate one-piece blank of foldable material which is cut and scored, comprising in combination:

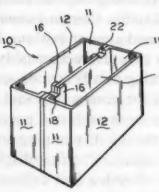
(a) said body member including a bottom panel and end and outer side wall panels connected along fold lines to opposed end and side edges of said bottom panel and extending up at right angles thereto;

(b) inner side wall panels connected along fold lines to upper edges of said outer side wall panels and extending downwardly therefrom in a spaced apart parallel relationship therewith;

(c) a pair of body side flaps hingedly attached to opposed side edges of said end wall panels and extending inwardly therefrom between said body inner and outer side wall panels;

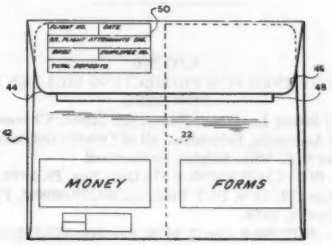
(d) said cover member including a top panel and end and side wall panels connected along fold lines to opposed end and side edges of said top panel and extending downwardly at right angles thereto;
(e) a pair of cover end flaps hingedly attached to opposed side edges of said cover side wall panels and extending inwardly therefrom between said cover and body member end wall panels when said cover member is in the closed position;
(f) a pair of cover locking flaps connected to opposed side edges of said cover end wall panels and extending inwardly therefrom between said body side flaps and outer side wall panels;
(g) each of said cover end wall panels and locking flaps being pivotable upwardly relative to the fold line connecting said cover end wall panels to said top panel and each of said body end wall panels and related side flaps being pivotable downwardly relative to the fold line connecting said body end wall panels to said bottom panel when the container is opened for dispensing; and
(h) said cover locking flaps having recessed portions for interlocking engagement with said cover end flaps to maintain the container in the closed position.

4,317,537
PARTITION STRUCTURE
James F. Nauheimer, Chicago, Ill., assignor to Container Corporation of America, Chicago, Ill.
Filed Dec. 19, 1980, Ser. No. 218,254
Int. Cl.³ B65D *5/48*
U.S. Cl. 229—42 **1 Claim**



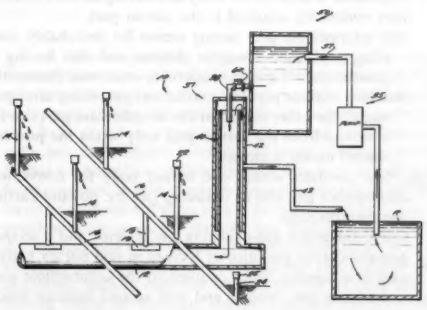
1. A partition for dividing a walled container into a pair of rectangular shaped cells, said partition being characterized by a single thickness common wall between the cells and side and end walls connected to each other and to the common wall to form a full perimeter liner within the container, said partition being formed from a cut and scored blank of paperboard or the like comprising:
(a) end and side panels foldably connected to each other and arranged in mirror relationship with respect to like panels by a common cut line;
(b) a first pair of connector panels foldable with respect to the distal ends of a pair of said end panels and connected to each other across said common cut line by a first connector tab;
(c) a second pair of connector panels foldable with respect to the distal ends of the other pair of end panels and connected to each other across said common cut line by a second connector tab;
(d) one of the second pair of connector panels having a width which is less than the width of the other one of the second pair of connector panels and having the same width as said first pair of connector panels;
(e) the width of the other one of the second pairs of connector panels being equal to the width of each of the side panels;
(f) the other one of said second pair of connector panels being of a single thickness and foldable to position between said first pair of connector panels and against said one of said second pair of connector panels so as to form the single thickness only common wall between the cells; and
(g) said first and second pair of connector panels being connected across score lines by respective first and second connector tabs, said other one of the second pair being notched to receive said first connector tab, and said second connector tab maintaining said second pair of connector panels in confronting relationship.

4,317,538
ENVELOPE
Seymour S. Alter, 31 Brianfield Dr., Great Neck, N.Y. 11020, and Steven Alter, 265 W. 11th St., New York, N.Y. 10014
Filed Aug. 30, 1978, Ser. No. 938,057
Int. Cl.³ B65D *27/08*
U.S. Cl. 229—72 **4 Claims**



1. A multiple-compartment envelope comprising a first compartment having an opening and a flap adapted for closing said opening, said flap having a backing of a material suitable for copying information written on said flap to an article placed therebelow, and a second compartment detachably secured to said first compartment, said second compartment being able to be folded under the flap of the first compartment so that information provided on said flap will be copied upon said second compartment, said flap including a form printed thereon opposite the backing, and the second compartment including a form substantially identical to the form printed on the flap, the forms being positioned such that when the second compartment is folded under the flap, the form on the flap overlies the form on the second compartment.

4,317,539
TRICKLE IRRIGATION
Keith B. Pollock, 225 Enfield Dr., Edinburg, Tex. 78539
Filed Nov. 30, 1979, Ser. No. 98,932
Int. Cl.³ A01G *25/02*; B01D *29/10*
U.S. Cl. 239—1 **27 Claims**



1. A low pressure, trickle irrigation system comprising:

a buried, generally horizontal main line adapted to be connected to a source of water;

a plurality of open-top emitters in communication with said main line and extending generally vertically a predetermined distance E above ground with the discharge points of all emitters having substantially the same height above sea level;

an open-top, closed bottom flush pipe in fluid communication with said emitters and extending generally vertically a predetermined distance L above ground, said distance L being significantly less than the lowest said distance E; and

capping means for removably capping said flush pipe open top so that no water may flow through the open top of said flush pipe when in place, and water may flow through the open top when not in place.

4,317,540

SAFETY BURNER FOR PROJECTING MOLTEN METAL POWDERS

Wolfgang Simm, Lausanne; Hans-Theo Steine, Chavannes, and Daniel Audemars, Echandens, all of Switzerland, assignors to Castolin S.A., Saint Sulpice, Switzerland

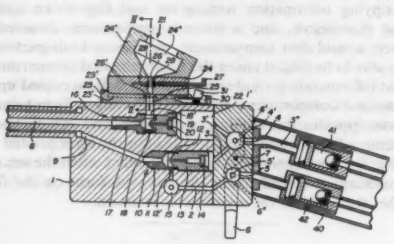
PCT No. PCT/CH79/00050, § 371 Date Nov. 29, 1979, § 102(e) Date Nov. 29, 1979, PCT Pub. No. WO79/00888, PCT Pub. Date Nov. 1, 1979.

PCT Filed Apr. 2, 1979, Ser. No. 177,759

Claims priority, application Switzerland, Apr. 6, 1978, 3694/78

Int. Cl.³ B05B *7/20*

U.S. Cl. 239—85 **9 Claims**



1. A safety burner for spraying metal powder in the molten state which comprises,

a burner body,

a powder supply device comprising a carrier part firmly connected to said burner body and having an intermediate part removably attached to the carrier part,

said intermediate part having means for detachably coupling a powder container thereto and also having a powder shutoff means cooperably associated therewith,

said intermediate part and said carrier part being arranged one to the other such that the intermediate part can be removed from the carrier part only when the powder shutoff means is closed,

gas-flow conduits within said burner body for conveying combustible gas, and an oxidizing gas and powder-carrier gas therethrough,

a first combustible gas-oxidizing gas injector and a second powder-carrier gas injector located in said burner body,

said first injector being coupled to the combustible gas-oxidizing gas conduit and said second injector being coupled to the powder-carrier gas conduit,

and gas-shutoff means coupled to said conduits feeding each of said first and second injectors.

4,317,541

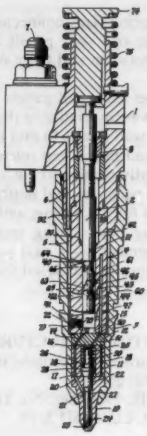
FUEL INJECTOR-PUMP UNIT WITH HYDRAULIC NEEDLE FUEL INJECTOR

John M. Beardmore, Howell, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 10, 1980, Ser. No. 167,231

Int. Cl.³ B05B *1/30*

U.S. Cl. 239—88 **4 Claims**

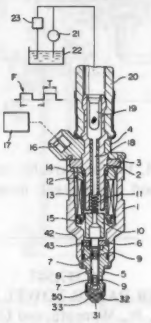


1. A unit fuel injector-pump including a housing means defining a supply chamber therein connectable to a source of fuel at low pressure and a pump bushing having a pump cylinder therein; a pump plunger reciprocably in said pump cylinder; said bushing having axially spaced apart lower, intermediate and upper ports for connecting said pump cylinder with said supply chamber, with each said ports openable and closeable by the plunger during its pumping stroke, and an opening at one end of said cylinder for fuel displaced by the plunger when said ports are closed; a fuel delivery passage connected to said opening and terminating at an outlet for the discharge of fuel; an injection valve normally closing said outlet but movable to open same in response to a predetermined relatively high fuel pressure developed in said pump cylinder by said plunger; a spring chamber separate from said passage; a spring in said spring chamber and operatively connected to said valve for normally biasing said valve to close said outlet, said valve being exposed to pressure in said spring chamber acting thereon in the direction toward closure of said outlet; and, a secondary hydraulic passage connected at one end to said spring chamber and by axial spaced apart lower, intermediate and upper control ports in said bushing to said pump cylinder and by a bleed orifice port in said bushing to said supply chamber, each of said control ports being sequentially closeable and openable by said plunger during its pumping stroke; said plunger having a first grooved portion and a second grooved portion that is connected by bypass passage means in said plunger to said opening; said first groove being connectable to said intermediate port and to said intermediate control port in response to downward movement of said plunger for venting said spring chamber to said supply chamber; said upper control port being axially located whereby to be operable for supplying high pressure fuel developed in said pump cylinder to said spring chamber in response to connecting said bypass means and said second groove portion thereto after a predetermined stroke of said plunger whereby high pressure fuel is supplied to said spring chamber to force said valve closed relative to said outlet for effecting termination of injection and to then discharge pressurized fuel via said bleed orifice port to said supply chamber.

4,317,542
FUEL INJECTOR

Teru Morishita, Shizuoka, and Daiki Fukuda, Susono, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Feb. 4, 1980, Ser. No. 118,465
Claims priority, application Japan, Feb. 23, 1979, 54-19676
Int. Cl.³ B05B *1/30*
U.S. Cl. 239—585 **11 Claims**



1. A fuel injector comprising: a housing, a fuel feed port arranged on one end of said housing; a fuel injection port arranged on the other end of said housing; a fuel passage formed in said housing and interconnecting said fuel feed port to said fuel injection port; a valve seat formed on an inner wall of said fuel passage; a needle movable in said housing and having a tip which cooperates with said valve port dividing said fuel passage into a first passage section located between said fuel feed port and said valve port and a second passage section located between said fuel injection port and said valve port, said first passage section being filled with fuel the pressure of which is maintained constant, and means for actuating said needle to open said normally closed valve port and allow the fuel to be injected from said fuel injection port, wherein the improvement comprises a fuel swirl chamber arranged in said housing between said second passage section and said fuel injection port and having a circumferential inner wall which extends around an axis of said fuel swirl chamber, said second passage section having one end connected to said valve port and the other end which opens into said fuel swirl chamber and being tangentially connected to the circumferential inner wall of said fuel swirl chamber, said fuel injection port extending along the axis of said fuel swirl chamber and opening into said fuel swirl chamber, wherein the effective flow of said valve port created when said needle fully opens said valve port is greater than that of said second passage section, and wherein said second passage section includes a passage portion located immediately downstream of said valve port and formed between an inner wall of said passage section and said needle, said passage portion having a cross-sectional area which is maintained constant independently of the position of said needle when said needle moves away from said valve seat.

4,317,543
PROCESS FOR SEPARATING COPPER AND IRON MINERALS FROM MOLYBDENITE

Juan P. Olivares, P.O. Box 20, Nacozari, Sonora, Mexico

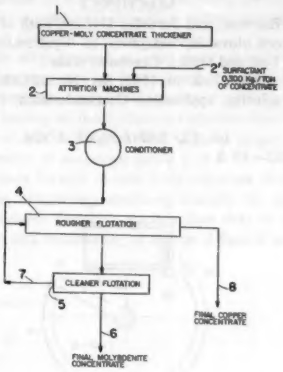
Filed Nov. 28, 1980, Ser. No. 211,470
Claims priority, application Mexico, Nov. 29, 1979, 180245
Int. Cl.³ B02C *23/20*
U.S. Cl. 241—16 **7 Claims**

1. A process for the separation of copper and iron ores from molybdenite which comprises:

providing a copper concentrate containing molybdenite and iron ore in an attritioning stage at a concentration of between about 50 and about 60% solids;

adding to the concentrate in the attritioning stage a surfactant comprising alkyl esters of sodium and/or calcium sulfosuccinic or sulfosuccinamic acids;

passing the resultant pulp to a conditioning stage wherein the concentration of solids is reduced to between about 20 to 25% at a pH value of between about 6.0 and 8.5;



passing the resultant material to a bank of flotation cells and recovering a concentrate of molybdenite by floatation;

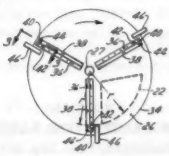
treating the molybdenite concentrate in at least one cleaning stage; and

recovering a final molybdenite concentrate which contains more than 90% of the original molybdenite and less than 5% of the undesirable ores.

4,317,544
CHIPPER

Joseph A. Lapointe, Pointe Claire, Canada, assignor to Domtar Inc., Montreal, Canada

Filed Jan. 14, 1980, Ser. No. 111,806
Int. Cl.³ B02C *16/08*
U.S. Cl. 241—57 **10 Claims**



1. A debris separating chipper comprising; a housing, a rotatable disc mounted in said housing for rotation on an axis of rotation, a front chamber and a rear chamber in said housing, a chip outlet from said rear chamber and a debris outlet from said front chamber, a feed inlet for directing wood longitudinally into said chipper through said front chamber, said disc having a cutting face, said cutting face forming one wall of said front chamber, at least one knife on said cutting face, said knife having an effective cutting length sweeping said feed inlet in a position to cut wood fed through said feed inlet, a slot in said disc leading said knife in a position to receive chips cut by said knife and permit them to pass through said slot, passage means extending radially outward beyond an end of said effective cutting length of said knife remote from said axis of rotation, said passage connecting said slot with said front chamber means in said passage to deflect material travelling through

said passage into said front chamber for ejection through said debris outlet.

4,317,545

METHOD OF AND APPARATUS FOR EXCHANGING FULL BOBBINS FOR EMPTY ONES IN TEXTILE MACHINES, PARTICULARLY OPEN-END SPINNING MACHINES

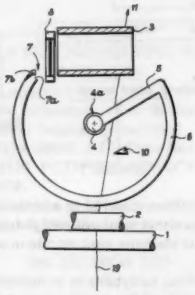
Frantisek Burysek, and Jaroslav Dykast, both of Usti nad Orlici, Czechoslovakia, assignors to Vyzkumny ustav bavlnarsky, Usti nad Orlici, Czechoslovakia

Filed Feb. 14, 1980, Ser. No. 121,483

Claims priority, application Czechoslovakia, Feb. 15, 1979, 1020-79

Int. Cl.³ B65H *54/02, 67/04*

U.S. Cl. 242—18 A **15 Claims**



1. A method of replacing a first, full bobbin having a core in the form of a tube by a second, similar empty one in a textile machine having take-up rollers for first forwarding yarn to yarn winding mechanism for said first bobbin and later forwarding yarn to said second bobbin, comprising gripping the yarn at a location in the span thereof between the take-up rollers and the yarn winding mechanism, severing the yarn at a place downstream of the location at which it is gripped, pulling the gripped end portion of the yarn into a first end of the interior of the second, empty tube, through such tube, and out the second end thereof, and securing the yarn against escape from the interior of the second tube.

4,317,546

COILING APPARATUS FOR FASTENER STRIPS

Bernhard Grusa, Plochingen, Fed. Rep. of Germany, assignor to Karl M. Reich Maschinenfabrik GmbH, Nuertingen, Fed. Rep. of Germany

Filed Apr. 15, 1980, Ser. No. 140,432

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1979, 2916725

Int. Cl.³ B65H *17/02, 17/20, 23/00*

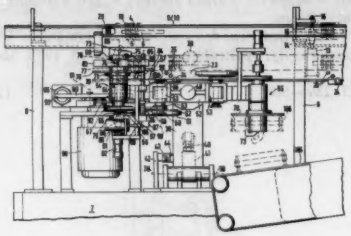
U.S. Cl. 242—55 **10 Claims**

1. A coiling apparatus for fastener strips comprising:

(a) base frame means, parallel guide track means including two parallel rails operatively supported by said base frame means for movably carrying a fastener strip in said guide track means so that the individual fasteners extend substantially vertically with their longitudinal axis,

(b) drivable coiling mandrel means operatively arranged relative to said guide track means for receiving a fastener strip from said guide track means, substantially vertically arranged axis means holding said coiling mandrel means,

(c) holding means for said fastener strip, arranged to hold a fastener strip so that it moves onto the coiling mandrel means, and



(d) means (**13, 14, 15**) for movably securing at least one of said rails of said guide track means to said base frame means.

4,317,547

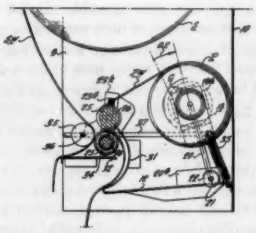
TRANSFER PAPER TOWEL DISPENSER

Andrew S. Graham, Jr., Wyncote, and Coleman D. Berg, Philadelphia, both of Pa., assignors to Fleck Industries, Inc., Willow Grove, Pa.

Filed Jul. 7, 1980, Ser. No. 166,751

Int. Cl.³ B65H *19/04*

U.S. Cl. 242—55.3 **15 Claims**

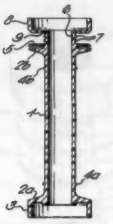


1. A towel dispenser for sequentially feeding towel webs from a primary roll in a first station, and a secondary roll in a second station, towel feed mechanism including a pair of parallel shafts having at least one pair of cylindrical web gripping and feeding surfaces providing a feed nip for paper webs delivered from rolls in said stations and being located inboard of the lateral edges of a paper web engaged in said feed nip, drive means for rotating one of said shafts, mounting means for a primary paper roll in said first station with the primary roll web extended through said feed nip to effect dispensing of said primary roll web, mounting means for a secondary roll in said second station with the secondary roll web lying in a path extended past said parallel shafts in spaced relation to the input side of said feed nip, a portion of one of said shafts in the end region thereof outboard of said web feeding surfaces and of the feed nip being of smaller diameter than the cylindrical feeding surface on said one shaft, and said outboard portion of said one shaft being threaded, a thread follower element mounted at the outer side of said extended path of the secondary roll web in the region of the threaded portion of said one shaft, the follower element being mounted for shifting movement axially of said threaded portion, and means responsive to exhaustion of the primary roll web to shift the thread follower element into engagement with the thread with the marginal edge portion of the secondary roll web therebetween and thereby cause the secondary roll web to enter the feed nip.

4,317,548
SPOOL FOR THREAD

Dieter Rottleb, Gutach, Fed. Rep. of Germany, assignor to Gutermann & Co., Aktiengesellschaft, Zurich, Switzerland

Continuation of Ser. No. 48,583, Jun. 13, 1979, abandoned. This application Jul. 25, 1980, Ser. No. 172,224
Claims priority, application United Kingdom, Jul. 7, 1978, 29239/78
Int. Cl.³ B65H *75/14, 75/28*
U.S. Cl. 242—125.2 9 Claims

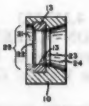


2. A plastics moulding for carrying thread comprising
(a) a spool member for carrying thread windings,
(b) a thread winding retaining flange mounted on one end of the spool,
(c) a flexible flange integral with said one end of said spool member at a fixed location axially outward from said thread winding retaining flange such that there is an axial space between said flexible flange and said retaining flange,
(d) a thread trapping member adapted to be fitted to said one end of the spool member so that a surface of the thread trapping member abuts against a surface of the flexible flange to form a groove for trapping thread, said groove being openable on flexing of the flexible flange toward said retaining flange for facilitating insertion of thread therein.

4,317,549
SNAP IN WIRE GUIDE HOUSING

O. Leon Thomas, Carrollton, Ga., and Eddie S. Baughn, Ranburne, Ala., assignors to Southwire Company, Carrollton, Ga.

Filed Apr. 17, 1980, Ser. No. 141,096
Int. Cl.³ B65H *57/06, 57/26*
U.S. Cl. 242—157 R 8 Claims

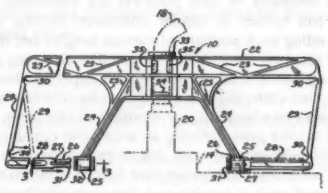


1. A wire guide housing for holding an eyelet or ring-like wire guide having certain inner and outer diameters, said housing having; a body constructed of an elastomer material, means for attaching said body to a frame member; and a wire passageway extending through said body and having an inner surface adapted to grip the outer surfaces of said wire guide, comprising:
wire entrance means formed in said body adjacent to a first face of said body, completely enclosed laterally by said body and having an inner diameter slightly smaller than the certain outer diameter of said wire guide;
a wire guide retaining groove formed in said body adjacent to said wire entrance means, completely enclosed laterally by said body and having an inner diameter slightly larger than the certain outer diameter of said wire guide; wherein said wire guide retaining groove further comprises a circular compartment concentric to the longitudinal axis of said wire passageway, larger in diameter than said wire entrance means and slightly larger in diameter than said wire guide to provide an area within said body where said wire guide can be retained while allowing said wire guide to creep in a rotational direction within said groove as wire passes through said wire guide;
a wire guide stop formed in said body adjacent to said groove, sharing a trailing face of said groove as a leading stopping surface, completely enclosed laterally by said body and having an inner diameter smaller than the outer diameter of said wire guide and slightly larger than the inner diameter of said wire guide; and
wire exit means formed in said body adjacent to said wire guide stop, completely enclosed laterally by said body, having an inner diameter no less than that of said wire guide stop and terminating at a second face of said body.

4,317,550
APPARATUS FOR SUSPENDING A DRAINAGE BAG

Richard E. Hannah, Spring Grove, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Sep. 17, 1979, Ser. No. 76,021
Int. Cl.³ B65B *67/12*
U.S. Cl. 248—95 21 Claims



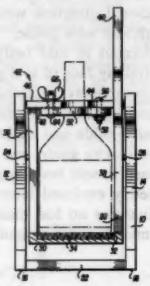
1. An apparatus useful for suspending from a structure a drainage bag into which body fluids can be drained, the apparatus comprising:
a hanger to which a bag can be attached, the hanger comprising a bag support spar and means for holding the bag and preventing any unintended separation of it from the hanger; and
a hook, the hook comprising at least one arm adapted for removable securement to a suspending structure and a second arm pivotally attached to the hanger,
the hanger and hook each being independent members which cooperate to suspend the bag in a vertical plane with respect to the ground when the hook is secured to a suspending structure, the hanger is attached to the hook, and a bag is attached to the hanger,
the means for holding the bag including two pairs of arms depending from the support spar, and retention means extending from one of the arms of each pair toward the other of said arms of the pair, said retention means being capable of locking to said other arm, whereby a portion of a bag may be captured along said retention means of each pair of arms and locked in place, each pair of arms being spaced on opposite sides of the center of said spar to permit the hanging of a bag having a central entry port.

4,317,551

APPARATUS FOR SUPPORTING A CONTAINER FOR LIQUID WHILE DISPENSING

George F. L. Bishop, 23808 S. Highway 172, Ignacio, Colo. 81137

Filed Jun. 30, 1980, Ser. No. 164,407
Int. Cl.[3] A47F 5/12
U.S. Cl. 248—141 15 Claims



1. An improved apparatus for supporting a bottle or similar container having an upwardly extending neck portion to facilitate dispensing the contents thereof, said apparatus comprising:

a base element;

a support platform pivotably mounted on said base element for rotation about a horizontal axis, said platform comprising means for preventing sliding movement of the bottom of a bottle or similar container upon rotation of said platform, said preventing means comprising a pad of resilient material on which the bottom of a bottle or similar container rests during use of said apparatus; and

means mounted on said platform for adjustably securing thereon bottles or similar containers having upwardly extending neck portions of various heights and diameters, said securing means comprising a first clamping jaw fixed to said platform and provided with upper and lower sides; a second clamping jaw adapted to be selectively pivoted to said first clamping jaw on either of said sides, said first and second jaws defining an adjustable opening through which said neck portions extend during use of the apparatus, whereby said bottles and similar containers having necks of various heights and diameters may be accommodated; a slot extending through one jaw at a point spaced from the pivot between said jaws and a fastener extending from the other jaw through said slot.

4,317,552

UNIVERSAL TRIPOD FOR SUPPORTING A CAMERA OR THE LIKE

Charles H. Weidler, 926 First St., Lancaster, Pa. 17603

Filed Dec. 26, 1979, Ser. No. 106,532
Int. Cl.[3] F16M 11/38
U.S. Cl. 248—168 10 Claims

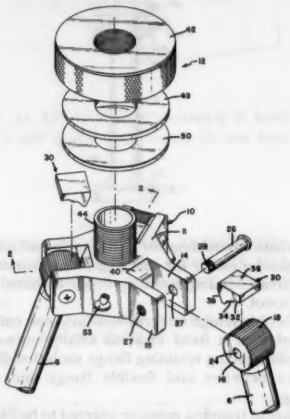
1. A tripod having a hub assembly and tripod legs pivotally mounted on said hub assembly for arcuate movement from closed positions, in which said legs are parallel to each other and are clustered around a tripod axis which extends through said hub assembly, to extended positions in which said legs extend divergently from said axis,

said hub assembly comprising a hub frame and clamping means, said hub frame having recesses therein at spaced intervals around the periphery thereof,

each of said legs having an inner end which is received in one of said recesses, said inner end of each leg being independently pivotally mounted on a leg axis which extends transversely of, and is spaced from, said tripod axis, each of said inner ends having a locking portion in said recess, said locking portion comprising a cylindrical surface which has said leg axis as a center,

a locking dog means in each of said recesses, each of said locking dog means extending radially with respect to its associated leg axis and being normally spaced from said locking portion of its associated leg, each of said locking dog means being movable independently of the other locking dog means towards and against said cylindrical surface of its associated leg,

said clamping means comprising a member movably mounted



on said hub frame for movement towards and away from said locking dog means, said clamping means being engageable with all of said locking dog means simultaneously and being effective to move said locking dog means in unison towards their associated locking portions whereby,

upon extending said legs and placing said legs on a surface, said legs will assume extended positions with respect to said tripod axis, and upon movement of said clamping means towards said locking dog means, said locking dog means are pushed against said cylindrical surfaces thereby to lock said legs against movement.

4,317,553

PROJECTION SCREEN STAND

Helmut Meinunger, Radevormwald, Fed. Rep. of Germany, assignor to Mechanische Weberei GmbH, Bad Lippspringe, Fed. Rep. of Germany

Filed May 29, 1980, Ser. No. 154,226
Claims priority, application Fed. Rep. of Germany, May 30, 1979, 2922027
Int. Cl.[3] F16M 11/38
U.S. Cl. 248—171 10 Claims

1. A stand, especially for a projection screen, comprising:

a post;

a pivot-carrying body slidable along said post;

a plurality of legs pivotally connected at one end of each leg to said body at spaced-apart locations thereon whereby said legs are swingable relative to said body; and

a guide body fixed to said post at a lower end thereof and formed with respective elongated openings each extending radially outwardly from said post and slidably receiving a respective leg whereby displacement of said pivot-carrying body toward said guide body spreads said legs

and displacement of said pivot-carrying body away from said guide body contracts said legs toward said post, said

guide body being provided on an upper side thereof with an annular recess receiving said pivot-carrying body.

4,317,554

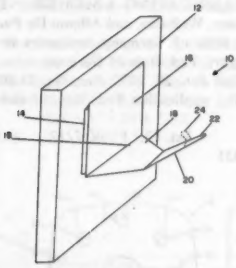
WREATH HANGER

Timothy M. Winger, Lancaster, Pa., assignor to Novelty Manufacturing Company, Lancaster, Pa.

Filed Mar. 10, 1980, Ser. No. 128,910

Int. Cl.³ A47G *7/00*

U.S. Cl. 248—205 A **3 Claims**



1. A hanger for attachment of wreaths and sprays to monuments and tombstones comprising:

a flat sheet metal base section with one surface coated with adhesive; and

a second sheet metal section integral with and projecting away from the entire width of the base section and narrowing to a point, said second sheet metal section is itself bent to form two distinct sections, a bridge section and an outermost spindle section, angularly oriented to each other and the base section, so that the plane of the spindle section is oriented relative to said base section at an angle of less than 90 degrees, said spindle section being of such length, width and thickness that it can pierce a decoration, protrude through it, and, after penetrating the decoration, be bent back upon itself to lock the decoration onto the spindle section.

4,317,555

NON DESTRUCTABLY REMOVABLE ADHESIVE BACKING STRIP AND ARTICLE SECURING DEVICE UTILIZING SAME

James W. Hogg, Nashville, Tenn., assignor to Anchor Wire Corporation, Goodlettsville, Tenn.

Filed Nov. 26, 1979, Ser. No. 97,145

Int. Cl.³ A47F *7/14*

U.S. Cl. 248—467 **11 Claims**

1. Means for adhesively attaching two objects together for non-destructive detachment comprising:

a backing sheet of water-degradable fibrous material having sufficient tensile strength when dry to resist relative displacement between said two objects in the plane of said backing sheet when the objects are adhesively joined together by said sheet;

both surfaces of said backing sheet being coated with adhesive compositions, the adhesive composition on one of the surfaces being water-soluble;

said backing sheet being partially delaminated along a portion of its marginal edge by an inwardly directed slit in a plane disposed between said adhesively coated surfaces;

whereby after said backing sheet has been attached to the surface of one of said two objects by activation of said water-soluble adhesive, said objects may be separated by completing said delamination by tearing the backing sheet into two pieces.

4,317,556

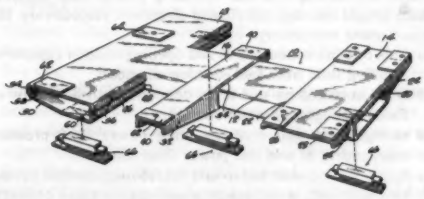
TURBINE SKID BASE

Arthur G. Dietrich, III, 7532 N. Mohawk Rd., Milwaukee, Wis. 53217

Filed Sep. 27, 1979, Ser. No. 79,399

Int. Cl.³ F16M *13/00*

U.S. Cl. 248—602 **6 Claims**



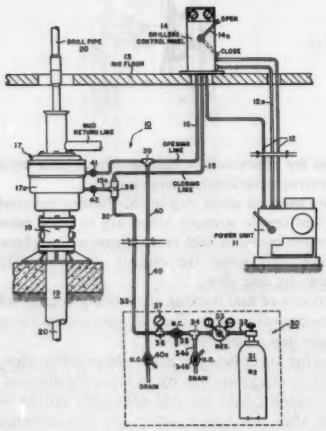
1. In combination, an electrical generator and motor means for driving the generator, and a support for said generator and motor means, the improvement wherein said support comprises an elongated beam having a longituinal center line, first, second and third support sections connected transversely to said beam and having wing portions extending laterally on each side of said beam with respect to said longitudinal center line and said wing portions being cantilevered from said beam, said wing portions containing mounting pads adapted to be connected to the parts supported thereon, said mounting pads being spaced from said center line and located adjacent the ends of said wing portions.

4,317,557

EMERGENCY BLOWOUT PREVENTER (BOP) CLOSING SYSTEM

Willis P. Orr, Lafayette, La., assignor to Exxon Production Research Company, Houston, Tex.

Filed Jul. 13, 1979, Ser. No. 57,462
Int. Cl.[3] E21B *33/06;* F15B *13/04*
U.S. Cl. 251—1 B 1 Claim



1. In a control system for blowout preventers used in well operations including a blowout preventer having at least one opening pressure chamber to which fluid pressure is applied to open said blowout preventer and at least one closing pressure chamber to which fluid pressure is applied to close said blowout preventer, one blowout preventer operating power fluid pressure source and an opening conduit and a first closing conduit connecting said one operating power fluid pressure source to said opening and closing chambers, respectively, the improvement comprising:

a drain conduit connected to said opening conduit capable of draining fluid from said opening chamber;

a valve arranged on said drain conduit controlling flow of fluids through said drain conduit;

a nitrogen gas source of operating power fluid pressure independent of said one power fluid source;

a shuttle valve connected to said first closing conduit having two positions, in one position said shuttle valve connecting said one power fluid source to said closing chamber and in another position connecting said other independent power fluid source to said closing chamber, said shuttle valve being arranged in said closing conduit adjacent said closing pressure chamber; and

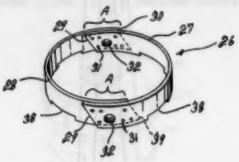
a second closing conduit connecting said independent power fluid source and said shuttle valve, said second closing conduit having arranged therein in sequence from said independent power fluid source to said shuttle valve a pressure regulator, a normally open drain valve, a normally closed valve and a pressure gauge, said pressure regulator and said valves and said drain conduit being located adjacent said independent power fluid source.

4,317,558

SEAT ASSEMBLY FOR BUTTERFLY VALVE

Michael Sherlaw, Dollard-Des-Ormeaux, Canada, assignor to Crane Co., New York, N.Y.

Division of Ser. No. 965,540, Dec. 1, 1978, Pat. No. 4,223,430.
This application May 27, 1980, Ser. No. 153,125
Int. Cl.[3] F16K *1/226*
U.S. Cl. 251—306 1 Claim



1. A seat assembly for a butterfly valve comprising:

an annular resilient seat member;

a circular flexible band embedded in said seat member, said band having two substantially C-shaped circular band segments with the end portions of each segment having holes therein, said band is formed by overlapping the end portions of the two segments with the holes in alignment; and,

means for joining the overlapped end portions together prior to embedding said band in said seat member

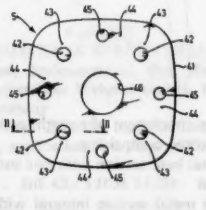
whereby the joined overlapped end portions provide said band with increased strength in the area of the holes.

4,317,559

MEMBRANE FOR A VALVE AND METHODS OF FABRICATING A MEMBRANE

Ludwig Finkbeiner, Walheim, and Albano De Paoli, Muhlacker, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 29, 1979, Ser. No. 53,565
Claims priority, application Fed. Rep. of Germany, Jul. 27, 1978, 2832932
Int. Cl.[3] F16K *7/12*
U.S. Cl. 251—331 5 Claims



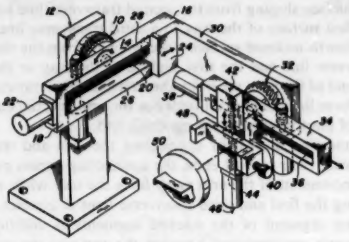
1. A membrane for use as a movable valve member in combination with a valve seat of a valve which includes: at least one metallic area of uniform thickness adhered to said membrane to form at least one metallic control area of a combined thickness greater than that of said membrane; a flexible area of said membrane surrounding each of said control areas and a clamping area surrounding each of said flexible areas; said clamping areas of said membrane including a photographic lacquer layer thereon; said flexible area and said clamping area having a thickness less than that of said control area in combination with said membrane.

4,317,560

WORK MANIPULATOR

Wade E. Troyer, 680 Gateshead Rd., Troy, Ohio 45373

Filed Dec. 26, 1979, Ser. No. 106,748
Int. Cl.³ B23K 7/10
U.S. Cl. 266—48 25 Claims



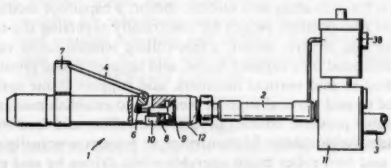
1. A work manipulator particularly advantageous for use in applying to the work a tool such as a welding or cutting tool comprising a plurality of functionally related arms, at least some of said arms being mounted for movement in different planes, means for moving said arms selectively and/or simultaneously including means for selectively rotating said arms simultaneously or selectively, means coupled to a portion of said arms to provide as between such means and the arm to which such means is coupled a defined path of movement of one relative the other, and work holder means coupled to at least a portion of said arms, said arms and said coupled means being selectively and/or simultaneously operable to manipulate work held by said work holder means to continuously present and move the same relative to a tool at the attitude required to effect a continuous weld or cut with or without a change in position of the tool.

4,317,561

HOLDER FOR AN OXYGEN LANCE

Manfred Schulz, Am Engsberg 4, 4030 Ratingen, Fed. Rep. of Germany

Continuation of Ser. No. 966,443, Dec. 4, 1978, abandoned. This application Jun. 19, 1980, Ser. No. 161,172
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1977, 2753899; May 12, 1978, 2820797; May 12, 1978, 2820798
Int. Cl.³ C21B 7/16
U.S. Cl. 266—265 7 Claims



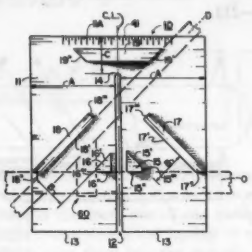
1. In a holder for an oxygen lance having a hose leading to an oxygen source and having a shut-off valve between said hose and said oxygen source, the improvement wherein said holder has at least one actuating device connected to said shut-off valve, said actuating device comprising an operating lever, said operating lever itself comprising a short, bent-down lever within said holder, said short, bent-down lever connected to a valve stem within said holder, said bent-down lever connected to a manually operable long lever arm disposed outside said holder, said valve stem opening the way through a second valve to said hose, said bent-down lever arm, when said long arm is in closed position, connected to and acting upon an actuator which, in turn, indirectly acts on said shut-off valve.

4,317,562

MITER BOARD ACCESSORY FOR TABLE SAWS AND THE LIKE

Robert J. Thibodaux, R.F.D. 1, Box 597-A, Thibodaux, La. 70301

Filed Apr. 30, 1980, Ser. No. 145,028
Int. Cl.³ B27B 27/10
U.S. Cl. 269—304 4 Claims



1. A miter board material holder for a circular table saw or the like for cutting boards and the like, comprising:

a laterally extending base member having an at least generally flat upper surface;

a series of five, vertically projecting, board guide element fixedly mounted on a first, upper side of said base and vertically projecting above said upper surface;

elongated, straight slot means for accommodating and allowing the saw blade of the saw to pass along said base member, said slot means comprising a slot through said base member extending along a substantial portion of said base member but through at most only one of its sides;

one of said guide elements being a laterally extending one, located in juxtaposition to the internal, terminal end of said slot and extending pass both sides thereof with a continuous vertical surface and terminating at the ends away from said slot in side, end, vertical surfaces which make forty-five degree angles with said slot, said side, end, vertical surfaces being usable for positioning a board at an angle of forty-five degrees to said slot and hence to a saw blade in said slot for producing a forty-five degree cut through the board;

two of said guide elements being extended, side, board guide elements symetrically positioned on opposite sides of said slot and extending along their longitudinal lengths at forty-five degree angles to said slot, said side, end, vertical surfaces of said laterally extending guide element in conjunction with the inwardly facing, longitudinal, vertical, sides of said side guide elements defining an "X" configuration for supporting boards on either side of said slot for producing forty-five degree cuts in the boards; and

two of said guide elements being relatively short intermediate board guide elements symetrically positioned on opposite sides of said slot and inboard of said two side guide elements, said guide elements terminating at vertical ends facing away from said laterally extending guide element forming a common vertical plane extending laterally across said base member at a ninety degree angle to said slot, the vertical ends of said side board guide elements at the ends away from said laterally extending guide element terminating in vertical guide surfaces making forty-five degree angles with the longitudinal axes of the extended side board guide elements, said guide surfaces being located in said common vertical plane for supporting a board across said slot for producing a ninety degree cut in the board.

4,317,563
BLOWING DEVICE IN SHEET DELIVERERS OF SHEET PROCESSING MACHINES

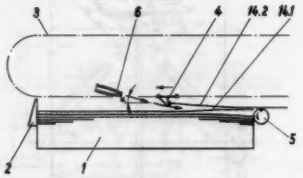
Hans Zimmerman, Coswig; Fritz Piper, Radebeul; Gerd Wierth, and Hartmut Nagel, both of Coswig, all of German Democratic Rep., assignors to VEB Kombinat Polygraph "Werner Lamberz" Leipzig, Leipzig, German Democratic Rep.

Filed Jan. 25, 1980, Ser. No. 115,284

Claims priority, application German Democratic Rep., Feb. 14, 1979, 211021

Int. Cl.³ B65H *31/00*

U.S. Cl. 271—211 **10 Claims**



1. A blowing arrangement for a sheet-delivering device of a sheet-processing machine, such as a printing machine, wherein sheets are transported to a sheet stack in predetermined direction and plane, the blowing device comprising a plurality of blowing nozzles arranged to be located above a sheet-delivering device receiving a sheet-stack and spaced from one another in a direction which is transverse to the sheet-transportation direction, said blowing nozzles being arranged at diverging angles to the sheet-transportation direction as considered in the sheet transportation plane, at an angle to the sheet-transportation plane, and offset from a front zone of the sheet stack toward a rear zone thereof so as to blow an air stream inclined in two planes and directed into the rear zone of the sheet stack, contrary to the sheet transportation direction and between a sheet placed in the sheet stack and a sheet transported to the latter, to thereby act upon these sheets in the region of a rear edge and rear corners of the sheet stack.

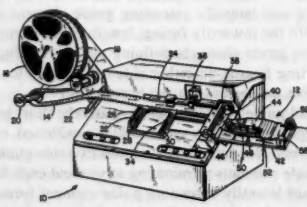
4,317,564
FILM TRAY ASSEMBLY FOR PHOTOGRAPHIC FILM CUTTER

Armer J. Willenbring, Edina; Warren J. Osby, and James W. Gausman, both of Minneapolis, all of Minn., assignors to Pako Corporation, Minneapolis, Minn.

Division of Ser. No. 25,754, Apr. 2, 1979, Pat. No. 4,280,381. This application Sep. 11, 1980, Ser. No. 186,187

Int. Cl.³ B65H *31/20*

U.S. Cl. 271—223 **11 Claims**



1. A device for stacking cut segments of photographic strip material, the device comprising:

a tray having first and second ends and a first surface upon which the segments are stacked, the first end being positioned proximate a source of the segments;

an arm positioned in generally overlying position with respect to the tray to receive and hold the segments between the arm and the tray, the arm having first and second ends and first, second, third, and fourth inclined surfaces, the first inclined surface sloping from the first end to a first transverse line which is closer to the first surface of the tray than the first end, the second inclined surface sloping away from the first transverse line and the first surface of the tray to a second transverse line, the third inclined surface sloping from the second transverse line toward the first surface of the tray to a third transverse line, and the fourth inclined surface sloping away from the third transverse line and the first surface of the tray to the second end of the arm, whereby the first and third transverse lines form lines of contact between the arm and the cut lengths of photographic strip material; and

connecting means for connecting the arm and tray proximate their second ends, the connecting means permitting movement of the arm away from the tray while maintaining the first and third transverse lines in contact with the top segment of the stacked segments as additional segments are deposited between the arm and the tray.

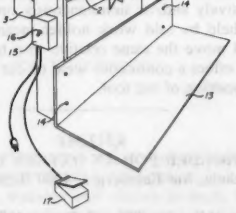
4,317,565
TRANSCRIPTION-COPY FEEDER

Larry L. Swette, 6 Stearns St., Newton Centre, Mass. 02159

Filed Jan. 30, 1980, Ser. No. 116,756

Int. Cl.³ B41J *11/36*

U.S. Cl. 271—274 **4 Claims**



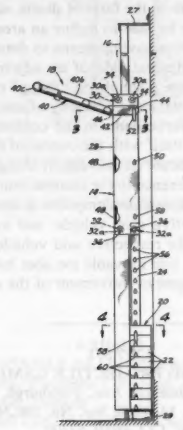
1. A transcription-copy feeder comprising two vertical support members attached to a horizontal L-shaped bracket, a powered feed roller rotatably mounted between said vertical support members, a reversibly rotatable electric motor for continuously driving said feed roller, a remote portable contact switch for activating said electric motor, a capacitor mediated remote two-position switch for electrically reversing the rotation of said electric motor, a free-rolling tension roller rotatably mounted on a support frame, said support frame pivotally attached to said vertical members, said support frame spring-loaded to said vertical support members to establish manually-releasable pressure contact to said feed roller, said feed roller provided with rubber friction rings to present a non-slip surface, said feed roller being operable when driven by said electric motor to translate transcription-copy paper between the contact junction made with said tension roller, a stationary index bar mounted between said vertical support members, said index bar located above said tension roller and forward of feed line of said transcription-copy paper at said contact junction to provide a stationary line index, a vertical keeper bar mounted between said vertical support members, said vertical keeper bar located above said index marker and behind said transcription-copy paper feedline to maintain said transcription-copy paper in a vertical position, a deflector bar mounted between said vertical support members, said deflector bar located above said feed roller and behind said vertical keeper bar to deflect said transcription-copy paper toward the rear of said transcription-copy feeder.

4,317,566

SINGLE COLUMN EXERCISING APPARATUS

Tim M. Uyeda, S. San Gabriel, and Parker E. Mahnke, Glendale, both of Calif., assignors to Marcy Gymnasium Equipment Co., Alhambra, Calif.

Filed Jun. 22, 1979, Ser. No. 51,049
Int. Cl.³ A63B *21/06*
U.S. Cl. 272—118 **10 Claims**



3. An exercising apparatus, comprising:

(a) a vertically reciprocative carriage including a housing and vertically spaced apart roller means mounted internally of said housing;

(b) only one single substantially vertically disposed central guide column having first and second guide surfaces, said first and second roller means of said carriage engaging and rolling along said first and second guide surfaces respectively;

(c) body engaging means projecting laterally outwardly from said carriage for engagement by a trainee to impart vertical reciprocative movement to said carriage, whereby a lifting force exerted on said body engaging element tends to apply an eccentric force to said carriage, said roller means being adapted to counteract the tendency to apply said eccentric force;

(d) a plurality of apertured weights, each provided with a centrally disposed aperture, said aperture being arranged to closely receive said central guide column; and

(e) selector means receivable within said aperture of said weights for selectively interconnecting said carriage and said weights whereby said carriage is selectively adjustable relative to said selector means and is biased in a vertically downward direction.

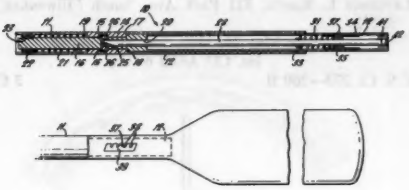
4,317,567

INSTRUCTIONAL AND/OR TEACHING DEVICES FOR BALL GAMES

Minden V. Blake, Virginia Water, Surrey GU25 4PH, England

Filed Sep. 26, 1979, Ser. No. 79,178
Claims priority, application United Kingdom, Sep. 29, 1978, 38794/78
Int. Cl.³ A63B *69/36*
U.S. Cl. 273—26 B **8 Claims**

1. A device for enabling a player to practice swinging a club, racket, bat or the like comprising an elongate member including two telescopically engaged parts, one said part having a portion which is gripped by the player at one end, and a release mechanism for preventing relative axial movement of the two parts of the member until it is released by centrifugal force, induced by the swing of the member, exceeding a predetermined value, said release mechanism including a weight within the elongate member, and movable axially of the member, means for restricting the movement of the weight until it is released by centrifugal force exceeding the said predetermined value, and means locking the two telescopically engaged parts together, said locking means being released by axial movement of the weight, the locking means comprising two balls which



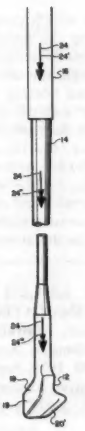
rest in recesses in the outer one of said telescopically engaged parts to lock said parts together and which are movable within a transverse bore in the inner one of said parts to release the parts, the weight comprising a rod having an end resting between the balls to urge them into the recesses whereby axial movement of the rod releases the balls.

4,317,568

GOLF CLUB WITH REFERENCE PLUMB MARK

John R. Green, P.O. Box 379, York, S.C.

Filed Mar. 6, 1980, Ser. No. 127,827
Int. Cl.³ A63B *53/00*
U.S. Cl. 273—163 A **5 Claims**



1. In a golf club of the type having a club head for striking a golf ball and a club shaft extending from said club head with the weight of said club head being unequally distributed about the longitudinal centerline of said shaft whereby, when the golf club is held loosely at the extending end of its shaft at a sufficient elevation so as to depend in pendulum-like manner, the longitudinal centerline of said shaft extends in only a single vertical plane, the improvement comprising a substantially linear reference mark positioned on said shaft and extending generally longitudinally along at least a portion thereof at a particular and predetermined unique location as determined by the weight distribution of said club head, said reference mark being positioned on the outer circumferential surface of said shaft coplanar with said longitudinal centerline of said shaft so as to extend in said vertical plane when the golf club is held in said pendulum-like manner, such that said club shaft will ap-

pear as a vertical plumb line only when viewed along a line of sight intersecting said reference mark and from a position from which said reference mark is located at substantially the circumferential center of the visible portion of the shaft.

4,317,569

GOLF PRACTICE ROD

Lawrence L. Kanitz, 511 Park Ave., South Milwaukee, Wis. 53172

Filed May 15, 1980, Ser. No. 150,080
Int. Cl.[3] A63B 69/36
U.S. Cl. 273—200 B 3 Claims

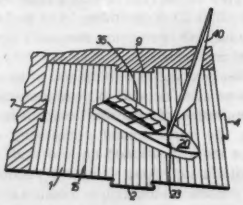
1. A golf practice rod which comprises a hollow rigid anchor located vertically in the ground, an upright elongated flexible shaft separate from the anchor and having a lower end portion extending through the anchor to secure the shaft therein and an upper end portion projecting vertically upwardly from the anchor and the ground and means on the bottom end of the flexible shaft preventing upward removal of the shaft from the anchor, and the upper end portion of the shaft being sufficiently flexible to flex in the area immediately above the upper end of the anchor horizontally from a vertical position when struck by the head of a golf club swung by a person standing on the ground adjacent the anchor and flexible shaft and then return to its initial position.

4,317,570

GAME WITH SIMULATED GAME PIECE

Robert E. Brunton, Baxter, Australia, assignor to Brunton & Brunton Pty. Ltd., Melbourne, Australia

Filed Jul. 30, 1979, Ser. No. 62,436
Claims priority, application Australia, Jul. 28, 1978, PD5273
Int. Cl.[3] A63F 9/14, 3/00
U.S. Cl. 273—246 21 Claims



1. A simulated game piece defining a participant for use in a game, said simulated game piece being a simulated glide which is attached to an endless loop which runs about two end rollers one positioned above the other and supported from a support member engagable on and movable over a horizontal surface, a rotatable member being provided coupled to the lower of said rollers to frictionally engage the said surface when the support member is displaced thereover to rotate the rotatable member and drive said lower end roller for driving said loop to cause vertical movement of the said simulated glider.

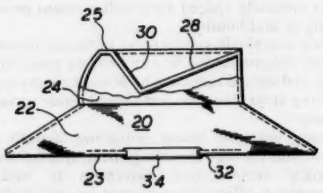
2. A game in the form of a simulated contest, said game comprising a set of cards in the form of sheets, each sheet being adapted to be laid side by side to define an area of the course of the contest, each sheet having means to determine its position relative to the adjacent side of an adjoining sheet and having means to indicate a simulated "going" or condition of the course over the sheet, and a plurality of simulated vehicles which constitute the participants in the contest, each vehicle having means to align itself with the course of the contest and indicator means to indicate its movement along the course of the contest without reference to the contest course, said indicator means of each said vehicle comprises a movable member carried by the respective said vehicle and arranged to be driven by contact of the respective said vehicle on the upper surface of a said sheet, said movable member having markings which indicate the degree of movement of the respective said vehicle.

4,317,571

BAT AND PROJECTILE GAME

Nicholas Vrcic, 1493 Daleland Ave., Pittsburgh, Pa. 15220

Filed Oct. 14, 1980, Ser. No. 196,347
Int. Cl.[3] A63B 67/00
U.S. Cl. 273—341 7 Claims



1. A game comprising:
a projectile having a length greater than its width;
a bat for striking said projectile; and
a base having a crown portion with an upper surface, said crown portion having a groove for supporting said projectile, said groove having a support surface that is inclined with respect to the upper surface and an end surface that forms an obtuse angle with said support surface, the depth of said groove below the upper surface at the intersection of the support surface and the end surface being not more than one-half the length of said groove along the upper surface of the base.

4,317,572

FIRING BUTT INCLUDING A HOUSING FOR A TARGET

Gottfried Iseli, Nunningen, Switzerland, assignor to Laspo AG, Diessenhofen, Switzerland

Filed Dec. 13, 1979, Ser. No. 103,523
Int. Cl.[3] F41J 1/10, 7/00
U.S. Cl. 273—406 16 Claims

1. A firing butt comprising a frame-like housing for a target with a main aperture in which the target is located and through which a projectile can penetrate the target and a protective frame including a first metal plate overlying the housing in the direction of fire to receive the impact of projections, a further plate or layer of elastomeric material which is constructed to close up automatically after penetration by a projectile, and a

second metal plate carrying the elastomeric layer, said second metal plate and said elastomeric layer overlying said first metal

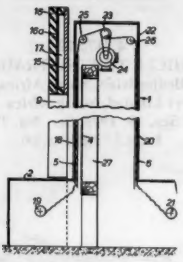


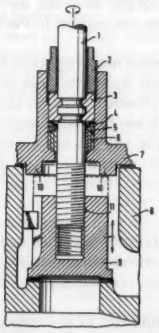
plate in the direction of fire, the metal plates defining a space between them.

4,317,573

VALVE SPINDLE SEALING ARRANGEMENT

Jouko Kärkkäinen, Pietarsaari, Finland, assignor to Oy Wartsila Ab, Helsinki, Finland

Filed Oct. 15, 1979, Ser. No. 84,911
Claims priority, application Finland, Oct. 16, 1978, 783137
Int. Cl.[3] F16K *31/50*
U.S. Cl. 277—113 4 Claims



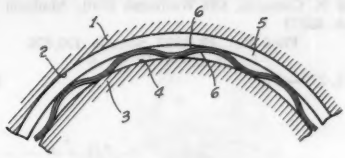
1. A sealing arrangement for a valve comprising a rotatable valve spindle connected to a valve body, said spindle passing through a cover portion of said valve, said arrangement comprising a radially supported elastic stuffing surrounding said spindle, an attachment member axially supporting said stuffing, and, in the inner space of said valve, a stationary stop member for said valve body, said stop member, being arranged to prevent at least substantially the axial movement of said valve body, when said spindle, in the open position of the valve, is further rotated in the opening direction of the valve, whereby a reaction force is induced in said stop member, which force is arranged to influence said stuffing via said spindle so as to obtain an increased axial compression in said stuffing, thereby pressing said stuffing, due to its elasticity, more firmly against its radial support, and for obtaining an axial movement transformable to a stuffing compressing axial force in said spindle, there are threads connecting said valve body to said spindle, said threads giving the valve body an axial movement relative to the spindle, when the latter is rotated.

4,317,574

EXPANDER FOR PISTON RING

Shoichi Honda, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 27, 1980, Ser. No. 153,019
Claims priority, application Japan, Jun. 20, 1979, 54-84628[U]
Int. Cl.[3] F16J *9/06*
U.S. Cl. 277—160 4 Claims



1. For use with a piston ring mounted in a groove on a piston of an internal combustion engine, the improvement comprising: an expander device adapted to be confined to the piston groove behind the piston ring; said expander device comprising a plurality of similar corrugated resilient expander rings, each comprising a substantially continuous strip encircling the piston, said resilient expander rings being placed one upon another in surface contact substantially throughout their annular extent with crests of the corrugations fitted to each other whereby to act in concert to exert a substantially uniform pressure against the inside periphery of the piston ring while at the same time offering increased flexibility when compared to a single expander ring.

4,317,575

HIGH TEMPERATURE GASKET

Ernest A. Cavicchio, Erie, Pa., assignor to GAF Corporation, New York, N.Y.

Filed Jun. 16, 1980, Ser. No. 160,145
Int. Cl.[3] F16J *15/10*; C08L *1/00*
U.S. Cl. 277—227 20 Claims

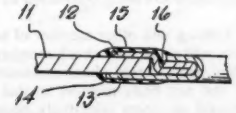
1. A high temperature, asbestos-free gasket comprising:
a. from about 5% to about 20% of an organic latex binder;
b. from about 5% to about 35% of cellulosic fibrous material;
c. from about 0% to about 30% of mineral wool;
d. at least about 50% of an inorganic filler; and
e. from about 0 to about 5% of a coloring additive, said percentages being on a dry weight basis of the gasket.

4,317,576

GASKETS

Clinton B. Barker, Kidmore End, and Martin E. J. Wright, High Wycombe, both of England, assignors to Engineering Components Limited, Slough, England

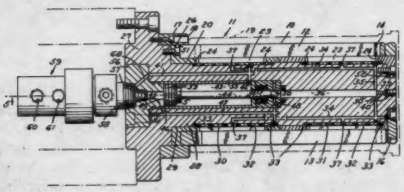
Filed Nov. 2, 1979, Ser. No. 90,858
Claims priority, application United Kingdom, Nov. 3, 1978, 43069/78
Int. Cl.[3] F16J *15/12*
U.S. Cl. 277—235 B 7 Claims



1. A gasket comprising a flat body portion formed with an aperture, said aperture containing an eyelet attached to the edge of said flat body portion, the eyelet including primary and

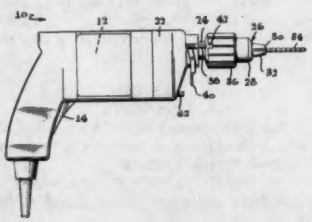
secondary sealing coaxial annular portions, said primary and secondary sealing portions being separated by a groove, and an annular seal of a rubbery sealing material deposited on said eyelet at least between said primary and secondary sealing portions, said sealing material filling said groove.

4,317,577
ROTARY EXPANDABLE TOOL WITH HYDRAULIC INTERNAL INTENSIFIER
Gordon N. Cameron, 859 Whitcomb Blvd., Madison Heights, Mich. 48071
Filed Mar. 19, 1980, Ser. No. 131,624
Int. Cl.³ B23B 31/40
U.S. Cl. 279—2 A 8 Claims



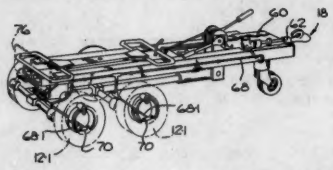
1. A rotary clamping tool having internal hydraulic pressure actuated means involving relatively high pressure requirements during rotation, a rotatable union connecting means for supplying relatively low pressure hydraulic fluid from a non-rotating outside source to said tool during its rotation means providing fluid communication between said pressure actuated means and said connecting means for initially admitting said low pressure hydraulic fluid to said pressure actuated means, and intensifying means within said tool operable during its rotation for subsequently closing off said communication means and converting said relatively low to said relatively high hydraulic pressure.

4,317,578
KEYLESS CHUCKING SYSTEM
Thomas R. Welch, 2730 N. Creston Dr., Hollywood, Calif. 90068
Filed Nov. 7, 1979, Ser. No. 91,979
Int. Cl.³ B23B 31/06
U.S. Cl. 279—60 33 Claims



6. A system comprising
a chuck having a body member and a sleeve member;
a machine tool having a motor and rotatable spindle, one of said chuck members being connected to be driven by said spindle;
means for holding said other member of said chuck so that said motor will rotate said chuck members with respect to each other, jaws in said chuck connected to said sleeve member and said body member so that relative rotation between said members selectively opens or closes said jaws; and
motor control means for controlling the direction of rotation and speed of rotation of said spindle, said spindle speed and direction control means being actuated when said chuck member holding means is actuated to rotate said motor at a speed less than maximum motor speed.

4,317,579
VEHICLE TOWING TRAILER
Franklin S. Louw, Bedfordview, South Africa, assignor to Mobi-Jack (Proprietary) Limited, South Africa
Filed Sep. 19, 1979, Ser. No. 77,052
Int. Cl.³ B60P 3/06
U.S. Cl. 280—402 3 Claims



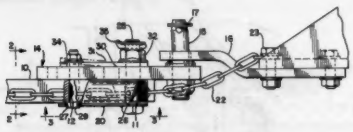
1. A carry towing trailer which includes:
a chassis having support means for supporting a vehicle to be carry towed;
a coupler at a leading end of the chassis for coupling to a towing vehicle for towing in a longitudinal direction;
a pair of trailer wheels rotatably mounted about a first transverse axis and supporting the chassis;
an automatic override brake connected to the coupler and operable on the trailer wheels;
said pair of trailer wheels having their axes mounted on a pair of arms pivotally mounted on the chassis about a second transverse axis parallel to the first transverse axis; and
hydraulic displacement means operable to displace said arms about said second transverse axis to cause raising and lowering of the chassis relative to said trailer wheels;
said trailer wheels being located beneath said support means for supporting the vehicle being carry towed whereby loss of hydraulic pressure in said displacement means during a towing operation allows said chassis to fall relative to the trailer wheels causing engagement of said support means with said trailer wheels and consequent application of a braking affect on said wheels.

3. A carry towing trailer which includes:
a chassis having support means for supporting a vehicle to be carry towed;
a coupler at a leading end of the chassis for coupling to a towing vehicle for towing in a longitudinal direction;
a pair of trailer wheels rotatably mounted about a transverse axis and supporting the chassis,
an automatic override brake connected to the coupler and operable on the trailer wheels;
said pair of trailer wheels having their axes mounted on a pair of arms pivotally mounted on the chassis about a second transverse axis parallel to the first transverse axis;
a further pair of trailer wheels having their axes mounted on a second pair of arms pivotally mounted on the chassis about a third transverse axis parallel to and disposed forwardly of said second transverse axis;
connecting means interconnecting the first and second pairs of arms to ensure that they move in unison; and
means operable to rotate said arms to cause raising and lowering of the chassis relative to all the trailer wheels;
said support means being located between said first and second pair of trailer wheels whereby to distribute the weight of the vehicle being carry towed substantially uniformly on the four trailer wheels.

4,317,580
HITCH ADAPTER

Thomas J. Scarnato, Barrington; Manfried L. Hoch, Romeoville, and Robert C. Miner, Clarendon Hills, all of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Apr. 25, 1980, Ser. No. 143,660
Int. Cl.³ B60D 1/02
U.S. Cl. 280—415 R 6 Claims



1. A hitch adapter for attaching a trailing implement to a tractor, said tractor having a rearwardly extending drawbar including horizontal top and bottom surfaces, a vertical hitch pin hole, and a vertical auxiliary hole spaced from the hitch pin hole, comprising:

an elongated adapter bar disposed adjacent said drawbar, said hitch adapter having a plurality of holes aligned respectively with said hitch pin hole and said auxiliary hole of said drawbar, said hitch adapter extending rearwardly of said drawbar to hitch means adjacent its distal end adapted to receive the tongue of said trailing implement and provide an axis of articulation between the tractor and the implement;

a spring steel locking bar having a plurality of holes aligned respectively with said drawbar holes disposed above said adapter bar, said locking bar being pre-bent to a normally non-planar condition;

a first bolt means extending through one of the respective holes in said drawbar, said adapter bar, and said locking bar and having a nut disposed in finger tight adjacent relation to said locking bar;

a second bolt means extending through the other of said holes in said drawbar, said adapter bar, and said locking bar, said second bolt having a nut and being tensioned to flatten said locking bar thereby tensioning said first bolt means; and

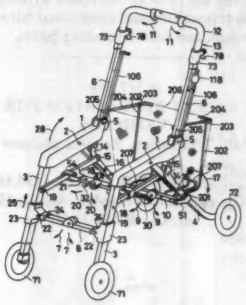
a lower support member disposed in clamped relationship beneath said drawbar, one of said bolt means being secured to said support member.

4,317,581
BABY CARRIAGE

Kenzou Kassai, Osaka, Japan, assignor to Kassai Kabushikikaisha, Osaka, Japan

Filed Apr. 17, 1980, Ser. No. 141,265
Claims priority, application Japan, Oct. 13, 1979, 54-132136; Nov. 9, 1979, 54-156262; Feb. 6, 1980, 55-14370
Int. Cl.³ B62B 7/06
U.S. Cl. 280—644 14 Claims

1. A baby carriage comprising: means for supporting the baby carriage with respect to the ground including a pair of front legs (3) each having a wheel (71), a pair of rear legs (4) each having a wheel (72), and connecting members (8, 10) for determining the distance between said front legs and between said rear legs; folding initiating means including a pair of pusher rod support angle bars (14) extending relatively upwardly and pivotally supported, each at its one end, on said pair of rear legs (4), and a pair of pusher rod means (6) pivotally connected at their lower ends to the other ends of said pusher rod support angle bars (14) and extending relatively vertically; connecting means (1, 18, 21, 23, 24, 25, 26, 30) operatively connected between said folding initiating means and said support means and so arranged that when said pusher rod support angle bars (14) are turned substantially downwardly in response to a downward displacement of said pusher rod means (6), said front legs, said rear legs and said connecting members are actuated for moving said front legs (3), said rear legs (4) and said pusher rod means (6) toward one another, said connecting means comprising a pair of front and rear leg supporting rods (1) including pivot means for pivotally supporting said pair of front legs (3) substantially at one end of said supporting rods (1) and said pair of rear legs (4) substantailly intermediate the ends of said supporting rods (1), said supporting rods (1) comprising substantially at the other end thereof further pivot means (5) for said push rod means (6), and wherein said connecting means further comprise a pair of connecting rod turning members (23) each slidably fitted on

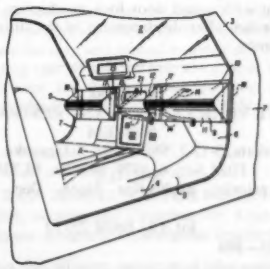


the respective front leg (3) in the central region thereof, a pair of bar links (25) connected between said pair of connecting rod turning members (23) and said pair of supporting rods (1) adjacent their front end, a pair of pivotally installed arms (26) extending inwardly from said pair of front legs (3), said carrage further comprising downwardly foldable front leg connecting means (8) pivotally supported at its opposite ends by said connecting rod turning members (23) and also pivotally supported by said arms (26) at pivot points (27) spaced a predetermined distance from each end of said front leg connecting means (8).

4,317,582
PROTECTIVE DEVICE FOR THE OCCUPANTS OF A MOTOR VEHICLE

Claude Cottin, Suresnes, and Bernard Le Veux, Vauhallan, both of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Jan. 23, 1980, Ser. No. 114,396
Claims priority, application France, Jan. 23, 1979, 79 01583
Int. Cl.³ B60R 21/02
U.S. Cl. 280—751 7 Claims



1. A knee protection device for holding back the lower body portion of an occupant of a vehicle passenger space in the event of an accident, comprising:

a yieldable structure extending cross-wise of the passenger

space between the passenger space and the forward part of the vehicle;

said yieldable structure including two separate sections supported by side panels of the vehicle on opposite sides of the longitudinal center line of the vehicle;

a frame also supporting said sections and including support feet extending forwardly into supported relationship with a separating panel of the vehicle separating the passenger space from the forward portion thereof, said frame including linkage means coupling portions of the frame at opposite sides of the vehicle, whereby the force of impact caused by the knees of an occupant striking the yieldable structure is transmitted and distributed between the opposite side panels and said separating panel.

4,317,583

PASSIVE SAFETY BELT SYSTEM FOR MOTOR VEHICLES

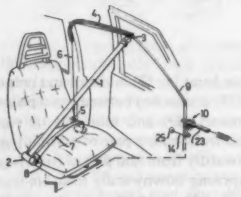
Stig T. L. Pilhall, Trollhättan, Sweden, assignor to AB Volvo, Goteborg, Sweden

Filed Mar. 25, 1980, Ser. No. 134,161

Claims priority, application Sweden, Apr. 2, 1979, 7902899

Int. Cl.³ B60R *21/10*

U.S. Cl. 280—804 **10 Claims**



1. In a passive safety belt system for motor vehicles having door lock mechanism, comprising a belt band which has an end connected to a reel mechanism and an effective portion extending diagonally across a vehicle seat from an upper point at the inside of a vehicle body side panel to a lower point adjacent the floor of the vehicle, the upper point of the diagonal band portion cooperating with a fitting which is displaceable in a guide running in said side panel above a door adjacent to the seat, in order to displace, in connection with opening of the door, the upper point of the diagonal band portion from a rear position, forwardly along the guide; the improvement in which the band fitting is joined to a filament which is connected to a pulling means of a differential mechanism having manual drive means which upon manual operation operates the pulling means to apply a pulling force to the filament to displace, with the aid of said fitting, the upper point of the diagonal band portion forwardly, said differential mechanism having means cooperating with a said door lock mechanism to release the lock mechanism after displacement of the fitting a predetermined distance.

4,317,584

PASSIVE VEHICLE OCCUPANT RESTRAINT BELT SYSTEM

Juichiro Takata, 3-12-1, Shinmachi, Setagayaku, Tokyo, Japan

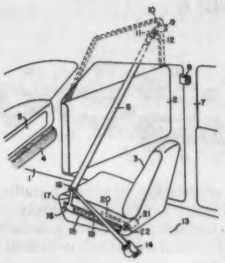
Filed Aug. 6, 1979, Ser. No. 63,735

Claims priority, application Japan, Dec. 1, 1978, 53-164586[U]

Int. Cl.³ B60R *21/10*

U.S. Cl. 280—804 **10 Claims**

1. A passive vehicle occupant restraint belt system comprising a belt leading from an inboard location adjacent the lower rear portion of the seat to an outboard location adjacent the rearward edge of the vehicle door, an elongated guide rail affixed to the seat on the inboard side of the seat, the guide rail extending generally lengthwise of the vehicle from adjacent the back to adjacent the front of the seat and sloping upwardly from back to front, a belt transfer guide mounted on the guide rail to move along the rail, the belt transfer guide including a vertically extending stem portion slidably mounted in the guide rail and a guide ring which is mounted on the stem a substantial distance above the guide rail, the belt slidably extending through the guide ring, and drive means for transferring the belt transfer guide along the guide rail between a rearward restraint position in which the ring is substantially at the level of the rear of the seat, and a forward, release position in which the guide ring is above the level of the front of the seat.



4,317,585

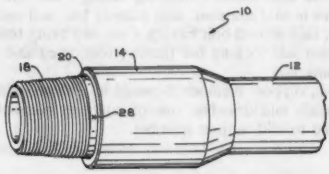
TORQUED DRILL PIPE IDENTIFICATION

Elvin G. Boice, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed May 30, 1980, Ser. No. 154,615

Int. Cl.³ F16L *15/00*

U.S. Cl. 285—93 **4 Claims**



1. In a length of drill pipe, said drill pipe having threads at each end thereof, the improvement comprising a permanent mark at each end of said drill pipe at a protected position thereof, said marks not being directly exposed to abrasion or the like either inside or outside said drill pipe in the assembled position with other similar drill pipes in a drill string, said marks being positioned in predetermined angular relationship to one another so that any permanent deformation of said drill pipe through torque in the course of use of said drill pipe can be determined by inspection of the relative positions of said marks.

4,317,586

PIPE STRESS/STRAIN NEUTRALIZER

Joseph K. Campbell, 215-52nd St., Delta, British Columbia, Canada V4M 2Y3

Filed Jan. 25, 1979, Ser. No. 6,439

Int. Cl.³ F16L *27/00*

U.S. Cl. 285—95 **2 Claims**

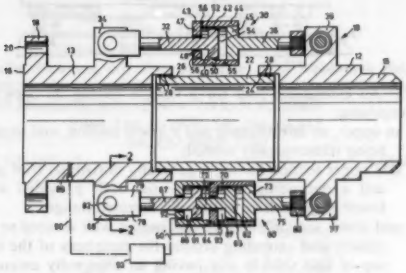
1. A pipe joint comprising:

a first sleeve member adapted to be affixed to an end of a first length of pipe,

a second sleeve member adapted to be affixed to an end of a second length of pipe,

telescoping means allowing the sleeve members to move axially with respect to each other while maintaining fluid-tight communication between them,

a plurality of contraction units located exteriorly of the sleeve members and the telescoping means, each including a first link member having an end adapted to be fixed with respect to the first length of pipe, and a second link member having an end adapted to be fixed with respect to the second length of pipe,



two pistons supported in stacked relationship on said one link member, and two cylinders supported by the other link member, each cylinder enclosing one of the pistons and each defining a variable closed volume on the side of the piston toward the sleeve member to which said one link member is attached,

and fluid-conduit means connected between the space inside one of the sleeves and both of said closed volumes, whereby the pressure in said closed volumes is a function of the pressure inside said one of the sleeves.

4,317,587

SPLIT FASTENING RING AND ASSEMBLIES EMPLOYING SAME

John E. Lawson, London, England, assignor to Armco Inc., Middletown, Ohio

Filed Feb. 11, 1980, Ser. No. 120,045
Int. Cl.³ F16L *21/06*
U.S. Cl. 285—137 A **11 Claims**

1. In a device of the type described, the combination of

a first member having

a cylindrical surface interrupted by a transverse annular retaining groove,

the retaining groove having a bottom wall, a first side wall which is frustoconical and slants away from the bottom wall, and a second side wall;

a second member having

a cylindrical surface,

a transverse annular surface, and

an annular frustoconical shoulder joining said transverse annular surface and said cylindrical surface of the second member;

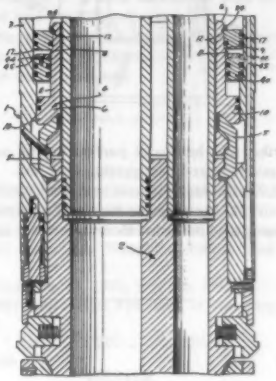
said first and second members being telescopically related with one of said cylindrical surfaces embracing the other, the frustoconical shoulder of the second member being parallel to and spaced from said frustoconical first side wall of the groove of the first member;

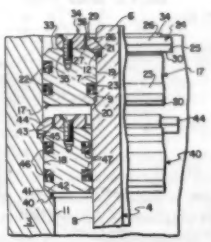
a split resilient fastener ring engaged in the groove of the first member in substantially relaxed and undistorted condition and having

a right cylindrical surface extending parallel to and at least immediately adjacent to the bottom wall of the groove,

a first frustoconical active surface facing the frustoconical first side wall of the groove and extending parallel thereto, and a second frustoconical active surface opposite and parallel to the first active surface and extending beyond said cylindrical surfaces of the first and second members and beyond the intersection of the frustoconical shoulder and the transverse annular surface of the second member, the second active surface of the fastener ring being disposed for flush engagement by the frustoconical shoulder of the second member; and

a stop carried by the first member and coacting with the second member to prevent relative axial movement between the first and second members in a direction which would separate the frustoconical shoulder and the fastener ring;





the first active surface of the ring engaging the first side wall of the groove over a radial distance which is at least as great as the radial distance over which the shoulder of the second member can engage the second active surface of the ring;

the shape and dimensions of the second member and the location of the stop carried by the first member being such that, when the stop and second member are engaged, the fastener ring can be inserted into the groove through the space between the frustoconical first side wall of the groove and the frustoconical shoulder of the second member.

4,317,588

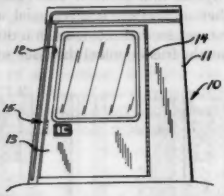
RAIN DEFLECTOR FOR DOOR

Claude Marchal, Seraing, and Christian Van Espen, Nalinnes, both of Belgium, assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 15, 1979, Ser. No. 117,584
Int. Cl.³ E05C *13/00*
U.S. Cl. 292—341.14 **11 Claims**

1. In a door latch mechanism (15) having a support (21) defining a base wall (22), a strike (37) projecting from said base wall and having an enlarged base portion (38) at said base wall, the improvement comprising:

a rain deflector (17) having a base wall portion (25) adapted to mount in facially overlying relationship to said support base wall (22), an inner transverse barrier wall portion (28) for intercepting rain water and the like passing inwardly past



said strike, said base wall portion having an opening (34) fitting said enlarged base portion (38); and

means (32,33) for securing said base wall portion (25) to said base wall (22) to cooperate with said enlarged base portion in retaining said deflector mounted to said support.

4,317,589

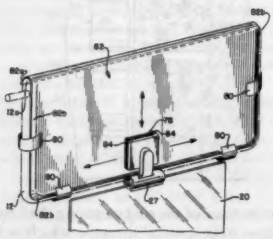
AUXILIARY SUN VISORS

John D. Kuss, 4092 Darrow Rd., Stow, Ohio 44224

Filed Mar. 26, 1980, Ser. No. 134,211

Int. Cl.³ B60J *3/00*

U.S. Cl. 296—97 D **8 Claims**



1. An auxiliary visor for mounting on a standard opaque vehicle sun visor to filter out harmful sun and/or glare rays passing through the vehicle windshield comprising:

a substantially flat elongated magnetizeable metal plate having one end bent to form a hook such that the plate may be clipped over an edge of the standard vehicle visor, the opposite end thereof presenting a flat surface on the standard visor and having plastic side rails affixed to opposite lateral edges for the length thereof and a plastic cross member affixed to the rails across the plate from one rail to the other at the end of the plate proximate the hooked end;

a rectangularly shaped transparent plastic light filter; and

a single magnet rigidly attached to a spring tensioned clip, said clip mounted to an edge of the plastic light filter and held in position thereon by the spring tensioned closure, said magnet being attached to the metal plate by its magnetic attraction and movable thereon between the plastic rails and along the lengthwise extent of the plate to any desired position and being in a stowed position on the standard visor by reason of its positioning under the cross member.

4,317,590

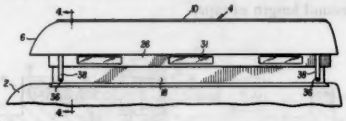
EXTENDABLE ROOF FOR RECREATIONAL VEHICLE

Jay M. Young, 1109 Carmen Ave., Holly Hill, Fla. 32017

Filed Apr. 21, 1980, Ser. No. 142,008

Int. Cl.³ B60P *3/32;* **B60J** *7/08*

U.S. Cl. 296—176 **11 Claims**



1. An extendable roof for a vehicle having an open top, comprising:

an upper, an intermediate and a lower section, said sections being telescopically related;

said upper section having a generally horizontal roof panel and a depending circumferential wall provided at its lower edge with an outwardly directed flange;

said lower section being an upstanding wall secured to said vehicle and extending around the periphery of the open top of said vehicle and having an outwardly extending flange at its upper edge, said lower section being dimensioned to telescopically receive said depending wall and flange of said upper section;

said intermediate section being an upright wall extending circumferentially around and outside both said walls of said upper and lower sections and having an inwardly extending flange at each of its upper and lower edges, its upper flange extending inwardly over said lower section and past the inner surface of the upstanding wall of said lower section in position to be engaged by the upper surface of the outwardly directed flange of said depending wall and its lower flange extending inwardly substantially to the outer surface of said upstanding wall and below the flange thereon.

4,317,591

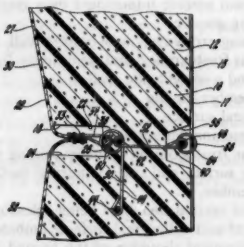
VEHICLE SEAT BOLSTER WIRE ASSEMBLY

Eugene P. Ramsey, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 27, 1980, Ser. No. 153,025

Int. Cl.³ A47C *7/02*

U.S. Cl. 297—455 **3 Claims**



1. A bolster wire assembly for embedment in a resilient foam cushion to facilitate attachment of a seat cover on a seating surface of the foam cushion and attachment of a mounting surface of the foam cushon on a seat frame, said bolster wire assembly comprising:

a longitudinally extending bolster wire adapted for placement in the foam cushion generally adjacent the seating surface thereof for attachment thereto of the seat cover;

stabilizing means attached to the bolster wire and adapted for embedment in the foam cushion to anchor the bolster wire against movement in the foam cushion;

a longitudinally extending anchor wire adapted for placement in the foam cushion generally adjacent the mounting surface thereof and adapted for attachment to the seat frame; and

means connecting the anchor wire with the bolster wire at longitudinally spaced intervals therealong so that the bolster wire is anchored to the seat frame against movement within the foam cushion by the forces imposed on the bolster wire by the seat cover during seating of an occupant upon the vehicle seat.

4,317,592

TRUCK BED UNLOADING DEVICE

Caroline Newman, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, 3615 Woolworth Bldg., 233 Broadway, both of New York, N.Y. 10007

Filed Aug. 6, 1979, Ser. No. 63,813

Int. Cl.³ B60P *1/00*

U.S. Cl. 298—7 **1 Claim**

1. A truck bed divider comprising inclined walls having spaced lower edges intersecting at a forward end, including an upper edge formed at the intersection of said walls, said upper edge intersecting the lower edges at said forward end and being spaced from said lower edges at a rearward end of said divider including means for removably and adjustably mounting said divider on a truck bed, said means include a pivotal connection along said upper edge of each of said walls, and connection between said walls and truck bed providing for relative movement therebetween, said connection between said walls and truck bed comprising a plate attached to each of said walls, said plates each having a groove to accept a bolt therethrough at variable locations along said groove.

4,317,593

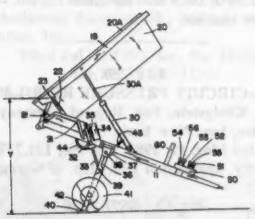
HIGH LIFT DUMP TRAILER

Jussi Sarvela, 1360 Terrace Dr., Apt. 303, St. Paul, Minn. 55113

Filed Dec. 19, 1979, Ser. No. 105,374

Int. Cl.³ B60P *67/32*

U.S. Cl. 298—11 **7 Claims**



1. A high dumping unit comprising:

a main frame, said main frame operable for holding a dump box;

a pair of retractable wheel support members pivotally attached to said main frame, a wheel having an axis mounted on each of said wheel support members, said retractable wheel support members operable for elevating said main frame, said wheel support members including stabilizing members for engaging a ground surface, each of said wheel support members pivotally mounted about the axis of each of said wheels to permit pivoting said wheel support member with respect to said main frame and each of said axis to thereby elevate the main frame so that when said main frame is in an elevated position said stabilizing members engage a ground surface to provide a stable support for said main frame; and

means for emptying a dump box located on said main frame, said means operable for emptying the contents of a dump box held in said main frame.

4,317,594

MOUNTING FOR MATERIAL LOADING MEANS IN A MINING TUNNELLING MACHINE

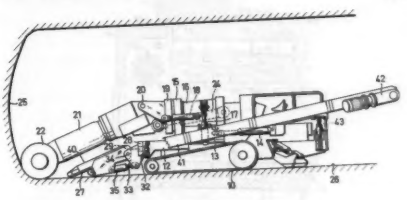
Eberhart Ünger, Lunen, Fed. Rep. of Germany, assignor to Gewerkschaft Eisenhütte Westfalia, Lunen, Fed. Rep. of Germany

Filed Jun. 13, 1980, Ser. No. 159,157

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1979, 2924550

Int. Cl.³ E21C *27/24, 35/20*

U.S. Cl. 299—64 **13 Claims**



1. In a machine for use in mining or tunnelling which comprises a chassis or frame, an arm mounted on the chassis for movement in both vertical and lateral senses, cutting means provided on the arm and material loading means for transferring material detached by the cutting means, the improvement comprising: the loading means includes material-receiving means located beneath the arm and its cutting means, and means for mounting the material-receiving means to the machine chassis for vertical and lateral tilting displacements, said mounting means having a bearing member connected via a pivot joint to said machine chassis, the bearing member being movable about said pivot joint to effect the tilting of the material-receiving means.

4,317,595

CHISEL FOR A CRUST BREAKING FACILITY

Edwin Gut, Steg; Erwin Arnold, Venthone, and Hans Friedli, Steg, all of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Sep. 5, 1980, Ser. No. 184,343

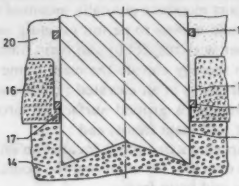
Claims priority, application Switzerland, Sep. 10, 1980, 8151/79

Int. Cl.³ C25C *3/14;* E21B *4/06*

U.S. Cl. 299—94 **12 Claims**

1. Chisel for a crust breaking facility for breaking through the solidified crust of electrolyte on an electrolytic cell which comprises a chisel having a vertical sidewall and at least one projection provided in the lower region of the vertical sidewall

of the chisel, said chisel having a cross-sectional dimension wherein all surfaces of said projections extend outwardly



substantially less than said cross-sectional dimension and project out 5–15 mm from the sidewall of the chisel.

4,317,596

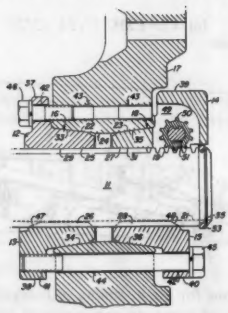
ADJUSTABLE WHEEL ASSEMBLY

Norman F. Lemmon, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.

Filed May 20, 1980, Ser. No. 151,721

Int. Cl.³ B60B *37/00*

U.S. Cl. 301—1 **14 Claims**



1. An adjustable wheel assembly comprising:

(a) an elongated axle having a rack and a keyway both constructed along a lengthwise portion of the periphery of said axle, said rack spaced apart from said keyway and formed of axially spaced gear teeth;

(b) two pairs of arc-shaped wedges surrounding said axle, each wedge having an axial semicircular portion with an inner cylindrical surface axially slidable upon said axle and an outer annular tapered portion formed about the axis of said inner cylindrical surface, each of said wedges further having a radial flange at the large end of said taper, each of said radial flanges containing a plurality of holes arranged in a circular arc outside of said respective tapered portion, one of said wedges having a radial opening therein exposing said rack to the interior of said wedge, and two other of said wedges having keys cooperative with said axle keyway for forcing simultaneous rotation of said two key containing wedges and said axle;

(c) a wheel hub concentric with said axle and said two pairs of arc-shaped wedges, said wheel hub having two oppositely aligned tapered bores complimenting and fitting said outer annular tapered portion of each of said wedges, said wheel hub further having radial portions containing complementary holes positionable adjacent to said radial flanges, certain of said wheel hub holes aligned with said holes in said radial flanges and certain other of said wheel hub holes aligned against imperforated surfaces on said radial flange of one of said key containing wedges;

(d) a plurality of fastening means for forcing said two key containing wedges between said wheel hub and said axle and for clamping said other two wedges to said wheel hub;

(e) a pair of jackscrews selectively receivable through two of said holes in one of said key containing wedges and threaded into two of said wheel hub holes to engage with two of said imperforated surfaces on said other key containing wedge, said pair of jackscrews capable of forcing said wheel hub and said two key containing wedges axially apart; and

(f) adjusting means rotatably mounted in said wedge having said radial opening, said adjusting means projecting through said radial opening and meshing with said rack.

4,317,597

WHEEL DISC AND METHOD FOR MANUFACTURE THEREOF

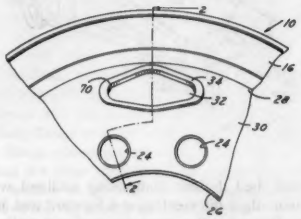
John H. Golata, Lansing, and John R. Kinstler, Mason, both of Mich., assignors to Motor Wheel Corporation, Lansing, Mich.

Division of Ser. No. 906,485, May 17, 1978, Pat. No. 4,241,597.

This application May 12, 1980, Ser. No. 148,792

Int. Cl.³ B60B *1/06*

U.S. Cl. 301—63 R **5 Claims**



1. In a concave spun tapered wheel disc adapted for use in a truck wheel which comprises a central portion containing hub and bolt holes, a peripheral edge adapted to be secured to a truck wheel rim, a radially tapering intermediate portion connecting said central portion to said peripheral edge and means forming hand holes in said intermediate portion, said disc having an inboard concave surface and an outboard convex surface, the improvement wherein said intermediate portion of said disc includes an embossed marginal region entirely surrounding each hand hole and having inboard and outboard surfaces uniformly and substantially identically offset in a direction away from disc concavity with respect to contiguous inboard and outboard surface portions of said disc intermediate portion surrounding each said marginal region, and wherein the concave inboard and convex outboard surfaces of said intermediate portion of said disc, including said inboard and outboard surfaces of each said marginal region, contain residual compressive stresses.

4,317,598

DUAL-CIRCUIT PRESSURE REGULATOR

Peter Tandler, Königstein, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Mar. 19, 1980, Ser. No. 131,717

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1979, 2915866

Int. Cl.³ B60T *8/26*

U.S. Cl. 303—6 C **24 Claims**

1. A dual-circuit pressure regulator comprising:

a main housing;

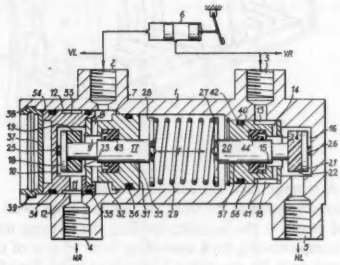
a first inlet chamber and a first outlet chamber connected to said first inlet chamber disposed in and adjacent one end of said main housing, said first inlet chamber being connected to one pressure circuit of a tandem master cylinder

and said first outlet chamber being connected to a wheel brake cylinder of one of a pair of rear wheels of a vehicle;

a second inlet chamber and a second outlet chamber connected to said second inlet chamber disposed in and adjacent the other end of said main housing, said second inlet chamber being connected to the other pressure circuit of said master cylinder and said second outlet chamber being connected to a wheel brake cylinder of the other of said pair of rear wheels;

a first pressure regulating valve disposed between said first inlet chamber and said first outlet chamber and loaded with a control force in the valve opening direction of said first valve;

a second pressure regulating valve disposed between said second inlet chamber and said second outlet chamber and loaded with said control force in the valve opening direction of said second valve which is opposite the valve opening direction of said first valve;



said first and second valves are closed upon attainment of a control pressure determined by said control force and will influence the pressure in their associated one of said first and second outlet chambers in accordance with a predetermined control behavior upon a further increase of pressure in their associated one of said first and second inlet chambers;

a single, common spring arrangement disposed in said main housing between said first and second valves to oppositely load said first and second valves with said control force; and

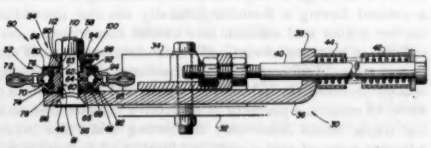
an auxiliary housing containing at least said first valve disposed in said main housing and slideable therein relative to said second valve to enable adjustment of said control force, said auxiliary housing being adapted to be secured in a fixed position after adjustment of said control force is completed.

4,317,599

BEARING ARRANGEMENT WITH SEPARABLE LUBRICATION COLLAR

Sidney E. Anderson, Geneseo, Ill., assignor to Deere & Company, Moline, Ill.

Filed Jul. 7, 1980, Ser. No. 166,013
Int. Cl.³ F16C *33/66*
U.S. Cl. 308—187 **8 Claims**



1. A lubricated bearing arrangement for mounting on a spindle, rechargable with lubricant in situ, comprising:

a bearing assembly having an inner member for mounting on the spindle generally concentrically and nonrotatably with respect to said spindle, an outer member journaled on the inner member, and a bearing lubricant space between the members, the inner member having axially opposite end faces and an axial through bore for defining, in cooperation with the spindle, a first lubricant cavity, and a passage in the inner member connecting said lubricant cavity with the lubricant space;

a lubrication collar having axially opposite end faces and an axial through bore for defining, in cooperation with the spindle, a second lubricant cavity and a lubricant passage connecting said lubricant cavity with an outer surface of the lubrication collar, the collar being mountable on the spindle generally concentrically and nonrotatably and with an end face substantially abutting an end face of the inner member, the faces cooperating in a lubricant retaining relationship and the respective first and second cavities connecting one with another; and

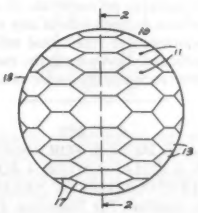
means for closing the respective axially remote ends of the first and second lubricant cavities so that luabricant introduced into the passage of the collar flows through the cavities and through the passage of the inner member and hence into the lubricant space of the bearing assembly.

4,317,600

SELF-LUBRICATED, HIGH-TEMPERATURE BEARING

Chou H. Li, 379 Elm Dr., Roslyn, N.Y. 11576

Filed Aug. 24, 1979, Ser. No. 69,350
Int. Cl.³ F16C *33/32, 33/34, 33/66*
U.S. Cl. 308—188 **11 Claims**



1. A bearing element having a bearing surface which defines a center and having a microstructure consisting of substantially uniformly shaped and equal-sized, elongated grains all aligned normally of the bearing surface to enhance the load-withstanding capacity, said microstructure having substantially symmetrical chemical composition and physical and chemical properties relative to the center of the bearing surface.

4,317,601

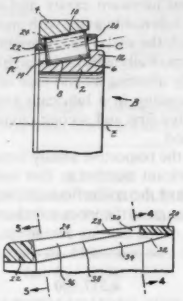
POLYMER CAGE FOR A TAPERED ROLLER BEARING

Charles W. Faigley, Jr., East Sparta, Ohio, assignor to The Timken Company, Canton, Ohio

Filed Mar. 31, 1980, Ser. No. 135,693
Int. Cl.³ F16C *19/00, 21/00, 33/04, 27/04*
U.S. Cl. 308—202 **10 Claims**

1. In a tapered roller bearing including an inner race having an outwardly presented tapered raceway as well as a thrust rib that projects outwardly at the large end of the tapered raceway and a retaining rib that projects outwardly at the small end of the tapered raceway, an outer race having an inwardly presented tapered raceway that surrounds the raceway of the inner race, and a plurality of rollers arranged in a row between the two raceways with the large ends of the rollers being against the thrust rib and the axial centerlines of the rollers defining a pitch circle, an improved cage for maintaining the proper spacing between the rollers, said cage being formed as a unitary structure from a synthetic resin and comprising: a large end ring that encircles the inner race at its thrust rib and ex-

tends across the large end faces of the rollers, a small end ring that encircles the inner race at its retaining rib and extends across the small end faces of the rollers, and bridges that are formed integral with and extend between the end rings into the spaced between adjacent rollers, the bridges lying entirely beyond the pitch circle, so as to be closer to the raceway for the outer race than the raceway for the inner race, and having sides that are presented toward the frustoconical side faces of the tapered rollers, each side including inner and outer beveled



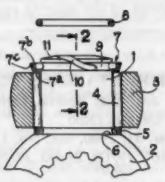
surfaces which are substantially planar and intersect, the inner surface being located closer to the inner race than the outer surface and being presented at a greater angle with respect to the pitch circle so that the outer surface extends further over the side face of the adjacent rollers than the inner surface, both the inner beveled surfaces on each side of any roller and the outer beveled surfaces on each side of any roller being spaced and otherwise positioned to retain that roller and prevent it from moving significantly away from the raceway of the inner race when the inner race and the outer race are separated.

4,317,602

METHOD AND DEVICE FOR ASSEMBLING IN PARTICULAR A ROLLER WITH A JOURNAL WITH INTERPOSITION OF NEEDLES

Michel A. Orain, Conflans Ste Honorine, France, assignor to Glaenzer Spicer, Poissy, France

Filed May 19, 1980, Ser. No. 151,168
Claims priority, application France, May 21, 1979, 79 12899
Int. Cl.³ F16C *19/26*
U.S. Cl. 308—207 R **3 Claims**



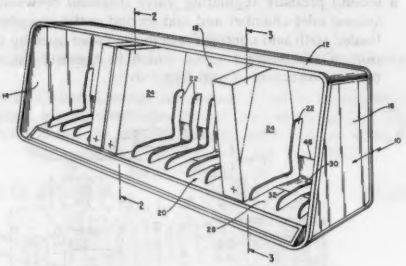
1. In an assembly comprising a journal, a roller rotatively mounted on the journal, rolling elements interposed between the journal and the roller and axially retained between means defining an annular radial support surface on the journal and an annular member in the vicinity of a free end of the journal, which annular member is held in position by an elastically yieldable split ring which is planar in the free state and trapped between the annular member and a groove in the journal the improvement comprising a passageway which is provided in the journal between the free end of the journal and said groove and is connected to said groove and has a substantially helical shape and a depth which is such that it defines with the adjacent annular member a gap permitting the insertion of the elastically yieldable ring.

4,317,603

VIDEO STORAGE RACK

Pasquale L. Pepicelli, Chelmsford, and Edward Yonkers, Newton, both of Mass., assignors to Data Packaging Corporation, Cambridge, Mass.

Filed May 8, 1980, Ser. No. 147,564
Int. Cl.³ A47B *81/06*
U.S. Cl. 312—9 **10 Claims**



1. A storage rack for cartridge comprising:
a housing open at the front and having a rear wall and a base,
and means in the housing dividing the housing into separate compartments each extending front to rear of the housing and each for receiving a cartridge in an upright position,
said rear wall supported with at least a portion thereof tilted rearwardly at its top end and forming a rear wall top support section for the cartridge and a rear wall lower section,
said base having means defining front and rear support surfaces joined at a pivot edge,
said base rear support surface extending in a plane substantially orthogonal to the rear wall top section whereby the cartridge is normally at rest on said rear support surface,
and said base front support surface extending in a plane at an obtuse angle to the rear wall top section whereby the cartridge may be manually engaged for rotation about said pivot edge so that the cartridge rests on said base front support surface with the cartridge thus partially extending from the housing,
said cartridge in the rest position engaging the rear wall top section and the base rear support surface, and in the selected position engaging the rear wall lower section and the base front support surface.

4,317,604

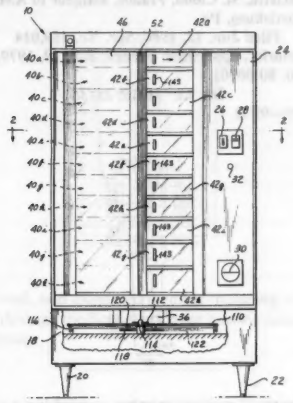
ALL-PURPOSE MERCHANDISER

Merrill Krakauer, 1 Deer Path, Short Hills, N.J. 07078

Filed May 5, 1980, Ser. No. 146,313
Int. Cl.³ A47F *1/00*; A47B *49/00*
U.S. Cl. 312—97.1 **25 Claims**

1. An all-purpose merchandiser adapted to vend articles over a wide range of shapes and sizes including in combination a cabinet having a front, a generally circular merchandise carrier within said cabinet, said carrier comprising a center column, a plurality of vertically extending partitions of transparent material supported on said carrier at substantially equal spaced locations therearound to divide said carrier into a plurality of sectors, a plurality of respective merchandise receiving trays, means removably supporting said trays between adjacent pairs of said panels, a plurality of said trays being supported on said panels at vertically spaced locations to divide said carrier into a plurality of levels, a window of transparent material on said front, said window being located in a

plane inclined rearwardly from a line relatively adjacent to the center of said front and being substantially parallel to a plane which is tangent to said carrier, a plurality of transparent access doors mounted in said front for movement between open positions and closed positions at levels corresponding to said carrier levels, said doors in said closed positions lying in a plane inclined rearwardly from a line relatively adjacent to the center of said front and generally parallel to a plane tangent to said carrier each of said window and said doors having a width approximately equal to the length of a chord subtended by the space occupied by one of said trays, each of said doors having a normal ambit of movement from closed to open position approximately equal to the length of said chord for permitting access to a tray positioned therebehind, means for dividing circumferentially into two compartments the trays at selected levels, means for limiting the opening movement of the doors at said selected levels to substantially half the normal ambit, means responsive to the deposit of coins aggregating the purchase price of articles at a certain level for freeing said doors



for movement toward open positions, means for stepping said carrier in a number of steps equal to twice the number of trays at a level and for accurately stopping said carrier at the end of a step and means for inhibiting opening of a door at a level other than one of said selected levels when said carrier stops at a mid tray point, said supporting means comprising vertically spaced locating and supporting openings in said columns, extensions on said trays adapted to be received in said openings, respective bosses on each of said trays adjacent to the front sides thereof, respective lugs on adjacent partitions adjacent to the outer edges thereof for receiving said bosses, said bosses having portions adapted to engage said lugs in response to a force applied to a tray in a direction radially of the axis of rotation of said carrier to prevent movement of the tray, channel-shaped members having side openings adapted to receive front edge portions of said trays and manually releasable interengageable means on said channel-shaped members and said partitions for holding said members in positions at which the side openings thereof receive portions of said trays to lock said trays in position.

4,317,605

BRUSH HOLDER

Tucko D. Alissandratos, Box 606, Tarpon Springs, Fla. 33589

Filed Aug. 19, 1980, Ser. No. 179,400

Int. Cl.³ A46B *17/00*; A47B *67/02*

U.S. Cl. 312—206 **5 Claims**

1. A wall mounted enclosure device for mounting at least one brush and the like, comprising:

a back housing,

said back housing including a recessed cavity formed by side, bottom, and top walls, said side walls coverging toward each other from said bottom walls toward said top wall, and a flange extending outwardly from said top, bottom and side walls in the same vertical plane;

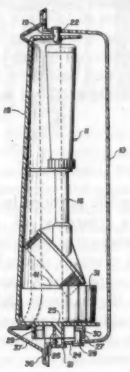
a front enclosure secured to said back housing;

said front enclosure including a central opening that conforms with said walls of said back housing,

said front enclosure further including an outwardly extending flange with its outer circumference having an angular end that extends over and surrounds said flange on said rear housing to enclose said flange of said rear housing,

a recessed brush holder enclosure door rotatably supported by said rear housing and partially enclosed by said front enclosure;

said enclosure door including top and bottom horizontally extending parallel flanges, said top flange including an aperture therein, said bottom flange including a downwardly extending first pivot pin for mounting said enclosure door to said back housing for pivotable motion



therein, and spaced ribs extending downwardly from said bottom flange and equally spaced from said first pivot pin;

a second pivot pin extending through said top wall of said rear housing into said aperture in said enclosure door and a bushing extending through said bottom wall of said rear housing for receiving said first pivot pin for pivotably mouting said enclosure door within said back housing and said front enclosure; and

an unexposed stop means extending upwardly from said bottom wall of said rear housing for cooperating with said spaced ribs on said enclosure door for positioning said enclosure door in either an open or closed position, at least one shelf rigidly supported by said enclosure door and extending across the recess therein for securing at least one brush on said recessed brush holder enclosure door;

whereby said enclosure door encloses said rear housing and said at least one brush when in the closed position and exposes said at least one brush when in the open position.

4,317,606

COMPLETE STUDIO

Jeanne D. Hastings, Old Stone Schoolhouse, Middle Rd., Lake George, N.Y. 12845

Filed May 6, 1980, Ser. No. 147,163

Int. Cl.³ A47B *27/00*

U.S. Cl. 312—231 **4 Claims**

1. A convertible cabinet-like article of furniture for artists's use and the like comprising:

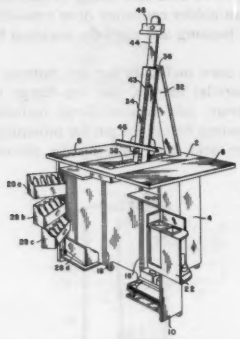
a base including spaced opposed side walls defining an enclosure therewithin,

a pair of complementary L-shaped door-like cabinet portions respectively vertically hingedly connected to one side of said side walls in normally substantially coplanar relation

therewith and the angled leg portions thereof extending in confronting relation to define a substantially planar end wall of the cabinet,

support feet for said cabinet side walls and for said door-like portions, said support feet permitting ready swinging outward movement of said door-like portions,

said cabinet having a top planar surface, thereby defining with said side walls and said L-shaped door-like portions the overall cabinet,



said L-shaped door-like portions having with the included angle thereof a plurality of storage compartment, whereby upon respective outward swinging of said L-shaped door-like portions through substantially 90°, the said respective compartments become accessible laterally on either side of the enclosure defined between said side walls, whereby said L-shaped door-like portions cooperate with said side walls to minimize overall dimensions of said cabinet in closed and open positions.

4,317,607

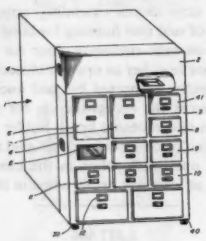
COMPARTMENTED CONTAINER

William Gomolka, 1 Patriot Dr., Canton, Mass. 02021

Filed Jun. 2, 1980, Ser. No. 155,451

Int. Cl.³ A47B *77/08*; F25D *11/02*

U.S. Cl. 312—236 **9 Claims**



1. A compartmented container comprising;

an insulated housing having a front member having adjacent doors including a freezer door associated with a freezer compartment and a food storage door associated with a food storage compartment, said food storage door having a plurality of apertures therethrough;

a plurality of drawers;

each said drawer being insertable through one of said apertures into the food storage compartment of said housing and being at least partially porous enabling air passage therethrough into the drawer;

means for guiding the drawer, enabling movement thereof between closed and extended positions relative to the housing;

at least one additional drawer disposed directly adjacent said freezer compartment and being insulated rather than porous

and means in the housing demarcating the freezer and food storage compartments and defining therein at least one aperture to couple sub-freezing air from the freezer compartment to the said additional drawer to maintain the air in said additional drawer at or below freezing thereby forming essentially an extension of the freezer wherein may be stored such oftenly used items as ice cream,

said additional drawer being insulated thus receiving substantially only sub-freezing air from the freezer compartment.

4,317,608

SLOTTED PATE TERMINAL FOR STRANDED WIRE

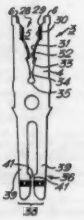
Helen Dechelette, St. Cloud, France, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 13, 1980, Ser. No. 159,014

Claims priority, application France, Jun. 29, 1979, 79 17039; Jan. 8, 1980, 80 00301

Int. Cl.³ H01R *13/38*

U.S. Cl. 339—99 R **14 Claims**



1. An electrical contact member comprising a conductive plate having therein a slot open to an edge of the plate, the slot having a mouth at the edge of the plate and leading to a first inwardly tapering section which leads to a second parallel straight sided section, the second section leading into a third inwardly tapering section having convex converging sides leading to a throat which opens into a fourth outwardly tapering section leading into a fifth inwardly tapering section having convex converging sides, the maximum width of the fifth section being less than that of the third section, the fifth section defining a closed end for the slot.

4,317,609

ELECTRICAL CONTACT

Scott J. Lapraik, Pleasantville, Pa., assignor to GTE Products Corporation, Stamford, Conn.

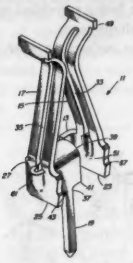
Continuation of Ser. No. 64,670, Aug. 8, 1979, abandoned. This application Jun. 4, 1981, Ser. No. 270,324

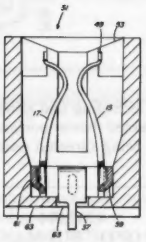
Int. Cl.³ H01R *13/40*

U.S. Cl. 339—221 R **1 Claim**

1. An electrical contact of the type having a pair of flat tines for contacting both sides of a substrate in combination with a mounting member of the type having an aperture with an inside surface and a floor section, said combination comprising an electrical contact including a U-shaped walled section having a lower edge lying substantially within a plane for engaging said floor section and a pair of leg sections forming a bight section, each leg section includes an outwardly projecting protuberance formed from a dented in said walled section engaging the inside surface of the aperture for securing said contact within said aperture, a pair of flat tines, each tine being inwardly bowed and extending upwardly from an upper portion of each leg section, an elongated member depending from

an upper portion of said bight portion and extending downwardly adjacent the inner surface of the bight portion through





a reverse bend, said elongated member including a tail portion extending through the floor section for making contact with an external circuit.

4,317,610

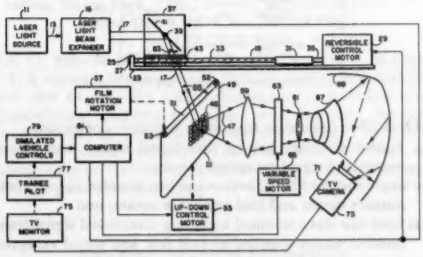
HOLOGRAPHIC TERRAIN SURFACE DISPLAY SYSTEM

Denis R. Breglia, Altamonte Springs, and Alfred H. Rodemann, Maitland, both of Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 20, 1979, Ser. No. 59,921

Int. Cl.[3] G03H *1/28;* G09B *9/08*

U.S. Cl. 350—3.77 **10 Claims**



7. A holographic terrain surface display system comprising, in combination:

a laser light source for producing a collimated monochromatic laser light source;

a laser light beam expander spatially disposed downstream from said laser light source for expanding said laser light beam to a predetermined cross-sectional area;

a rotatable mirror assembly spatially disposed directly downstream from said laser light beam expander, and having a signal input;

a holographic film positioned adjacent to said rotatable mirror assembly and having thereon a plurality of Fraunhofer holograms, with each Fraunhofer hologram scaled equivalent to said expanded laser light beam;

said rotatable mirror assembly being adapted for reflecting said expanded laser light beam onto said holographic film such that said laser light beam is incident upon only one of said plurality of Fraunhofer holograms during any time period;

said rotatable mirror assembly being adapted for varying the angle at which said expanded laser light beam is reflected thereby so as to vary the angle at which said expanded laser light beam is incident upon each of said Fraunhofer holograms;

each of said plurality of Fraunhofer holograms having therein a plurality of Fraunhofer diffraction patterns;

each of said Fraunhofer diffraction patterns being correlated to a predetermined angle of incidence of said laser light beam upon said hologram, and each of said Fraunhofer diffraction patterns being reconstructed at a predetermined image plane when said hologram is illuminated by said laser light beam at said predetermined angle of incidence;

a first lens, spatially disposed downstream from said holographic film, said first lens being adapted for forming a real image upon receiving each Fraunhofer diffraction pattern of said Fraunhofer holograms;

a rotatable prism positioned directly downstream from said first lens for rotating said real image formed by said first lens so as to modify said real image in an azimuthal direction to allow for the viewing of said real image;

a motor having an input and a rotatable shaft connected to said prism, said motor to rotate said prism when activated;

a second lens spatially disposed directly downstream from said prism, for projecting said modified real image onto a spherical front projection screen; and

a computer having a first signal output, and a second signal output, with the first signal output thereof connected to the signal input of said rotating mirror assembly, and the second signal output thereof connected to the input of said motor, said computer to provide a first control signal so as to effect the activation of said rotatable mirror assembly such that said rotatable mirror assembly varies the angle at which said laser light beam is reflected thereby, and a second control signal to effect the activation of said motor, thereby causing said prism to rotate so as to allow for the viewing of said real image in an azimuthal direction.

4,317,611

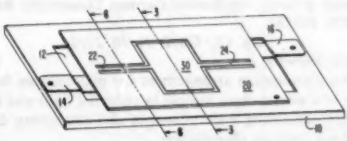
OPTICAL RAY DEFLECTION APPARATUS

Kurt E. Petersen, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 19, 1980, Ser. No. 150,839

Int. Cl.[3] G02B *27/17*

U.S. Cl. 350—6.6 **8 Claims**



1. Optical ray deflection apparatus, comprising

a base member,

a torsion bar arranged on said base member for torsional movement with respect thereto and having an area defining an optically reflective surface,

said torsion bar being an integral part of a torsion bar plate

and said reflective surface area comprising an enlarged portion centrally located and an integral part of said torsion bar,

said torsion bar plate being made of single crystal silicon and formed by an anisotropic etching process, and

electrodes arranged on said base member for producing an electrostatic field adjacent said torsion bar in turn for producing deflecting movement of said reflective surface area.

4,317,612

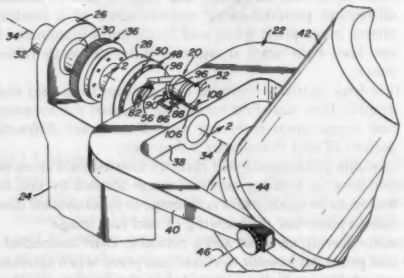
SIDEREAL TIME COMPENSATION DEVICE FOR ASTRONOMICAL TELESCOPE

Joseph Horvath, Rte 2, State Rd. 14, Box 309, Santa Fe, N. Mex. 87501

Filed Apr. 7, 1980, Ser. No. 138,036

Int. Cl.³ G02B *23/16*

U.S. Cl. 350—83 **10 Claims**



1. In an astronomical telescope having a mount, a rotatable shaft for carrying the telescope in a first rotational direction at a predetermined speed about the polar axis, an adjustable, sidereal time indicating means coupled to said shaft for rotation therewith and pointer means fixedly secured to said mount and disposed adjacent to said indicating means for indicating the rotational position of said indicating means at any time, the improvement comprising gear means coupled to said indicating means and motor means mounted for rotation with said shaft for engaging said gear means to cause said gear means to rotate said indicating means at said predetermined speed but in the opposite rotational direction as said first direction, whereupon when said shaft is rotated in said first rotational direction at said predetermined speed, said indicating means remains at a fixed rotational position with respect to said pointer means.

4,317,613

ILLUMINATION ARRANGEMENT FOR MICROSCOPES

Johannes Grosser, 12, Ziegelm',uml/u/ hlenweg, Jena, district of Gera, German Democratic Rep.

Filed Aug. 4, 1980, Ser. No. 171,989

Claims priority, application German Democratic Rep., Aug. 27, 1979, 215184

Int. Cl.³ G02B *21/10, 21/14*

U.S. Cl. 350—89 **8 Claims**

1. An illumination arrangement for microscopes for illumination of a microscopic sample in reflected light and transmitted light permitting a simultaneous and alternating dark-field and phase contrast illumination

comprising in optical alignment and considered in direction of light propagation

a light source for emitting light beams,

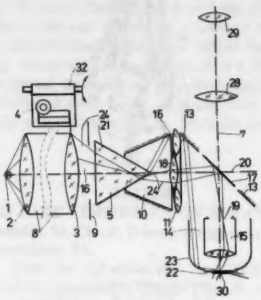
a condenser lens for shaping said light beams into a bundle of light,

an optical system for aperture increase,

a diaphragm for limiting said bundle of light,

an optical cone for splitting said bundle of light into a totally reflected beam portion and into a refracted beam portion, said optical cone being provided with a base face in opposition to said diaphragm,

a toroidal face for reflecting said totally reflected beam portion,



a setting plane for arranging said sample therein,

said totally reflected beam portion and said refracted beam portion being directed onto said sample in said setting plane.

4,317,614

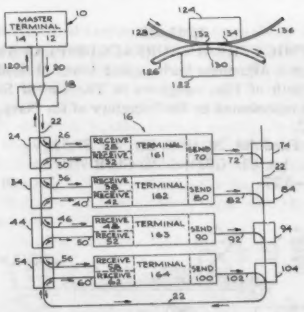
FIBER OPTIC BUS MANIFOLD

John P. Palmer, Pomona, Calif., assignor to General Dynamics, Pomona Division, Pomona, Calif.

Filed Feb. 20, 1980, Ser. No. 123,037

Int. Cl.³ H04B *9/00*

U.S. Cl. 350—96.16 **13 Claims**



12. A fiber optic data transmission system comprising:

a master terminal having directional signal transmission means and signal reception means;

a single-optical-fiber transmission line coupled to said transmission means and said reception means; and

at least one slave terminal including directional signal transmission means coupled to said line and signal reception means coupled to said line, said master and slave terminal directional signal transmission means being coupled to said transmission line for signal transmission in opposite directions, relative to each other, and said coupling of the slave terminal signal reception means to said line being effective to couple signals from both of said directional signal transmission means to said slave terminal;

wherein the slave terminal directional signal transmission means is coupled to the transmission line through a fiber optic coupler comprising:

a first smaller-diameter single-optical-fiber having an elliptical planar core terminus; and

a second larger-diameter single-optical-fiber connected to the transmission line and having an elliptical planar exposed core surface of substantially the same area as the terminus of the smaller fiber, said terminus and said elliptical surface being mated together and effective to produce data transmission to said transmission line from said slave terminal.

4,317,615

PROTECTIVE CASE FOR A QUARTZ-ROD OPTICAL WAVE GUIDE

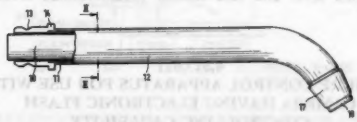
Wolf-Dietrich Herold, Hechendorf, Fed. Rep. of Germany, assignor to ESPE Fabrik Pharmazeurischer Preparate GmbH, Seefeld, Fed. Rep. of Germany

Filed Jul. 12, 1979, Ser. No. 56,985

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1978, 7821507[U]

Int. Cl.³ G02B *5/14;* A61B *1/24*

U.S. Cl. 350—96.32 **6 Claims**



4. A quartz-rod optical waveguide comprising:

an elongated curved quartz-rod;

a casing surrounding and enclosing said quartz rod, said casing comprising two separate rigid shells having edges tightly abutting each other along separation lines lying in a surface containing the center line of the quartz rod;

the major area of the inner surface of the casing being spaced from the outer surface of the quartz rod;

said shells having stepped edge portions overlapping each other;

means for detachably connecting adjacent first end portions of the shells;

the adjacent second end portions of said shells being shaped to form together one common circumferential groove adapted for snap-in engagement with a socket of an appliance.

4,317,616

FLUOROSILOXANE OPTICAL CLADDING

Raymond Clarke, Mt. View, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Oct. 9, 1979, Ser. No. 82,780

Int. Cl.³ G02B *5/14*

U.S. Cl. 350—96.34 **26 Claims**

1. A waveguide comprising a light transmitting optical fiber core and an optically clear, elastomeric, cross-linked polyfluorosiloxane cladding in contact with the core, the polyfluorosiloxane having a fluorine content of from 1 to 52% by weight, an elastic modulus of less than about 10^7 N/m^2, and substantially no fluorine substitution nearer to the silicon atom than the gamma carbon atom.

4,317,617

TRAFFIC CHANNELING DEVICE

Marshall J. Charlton, Monroe, La., assignor to Manville Service Corporation, Denver, Colo.

Filed Aug. 22, 1980, Ser. No. 180,237

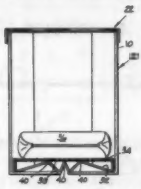
Int. Cl.³ G02B *5/12*

U.S. Cl. 350—97 **10 Claims**

1. An improved traffic channeling device for positioning on a highway in the normal traffic flow pattern, comprising, in combination:

(a) a moisture-proof paperboard shell structure including a body having a substantially uniform cross-section and an open end, and having formed on the other end thereof a horizontal inwardly folded flap structure having formed thereon means for preventing moisture from entering into the flap structure, the flap structure being formed by a plurality of triangularly shaped panels hingedly attached together and a vertical upwardly folded flap structure remaining portion formed by a plurality of triangularly shaped panels, said shell structure being designed for standing on the highway in a vertical position with said open end upward so that the horizontal portion of the inwardly folded flap structure is in contact with the highway surface and the vertical remaining portion of the upwardly folded flap structure is out of contact with the highway surface;

(b) separate means, associated with the upwardly folded remaining portion flap structure and positioned internally



and within the lower portion of the shell structure on top of the inwardly folded flap structure and in contact therewith around the lower inner periphery of the shell structure as well as around the central portion of the flap structure, for aiding the forming of the vertical standing shell structure in a predetermined shape, the aiding means also serving as a means to support an object positioned over the flap structure to hold the shell structure in a predetermined position on the highway, the support being given around the inner periphery of the shell structure as well as in the central portion of the flap structure through the vertical upwardly folded flap structure remaining portions; and

(c) means, associated with the outside of the vertical standing shell structure, for warning the traffic flow that the device has been positioned on the highway in the normal traffic flow.

4,317,618

VIBRATING SCREEN FOR IMAGE PROJECTION

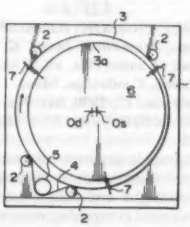
Makoto Murakoshi, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed May 1, 1980, Ser. No. 145,732

Claims priority, application Japan, May 2, 1979, 54-54411

Int. Cl.³ G03B *21/56*

U.S. Cl. 350—120 **4 Claims**



1. A vibrating screen for image projection comprising a fixed support plate, a rotatable disc provided on the fixed support plate to rotate about an axis of rotation fixed with

respect to the support plate, said rotatable disc having an eccentric circular recess, a circular screen plate rotatably inserted in said circular recess, a restraining means for preventing said circular screen plate from rotating relative to said support plate with a tolerance to allow the circular screen plate to move in a circular motion in said rotatable disc, and means for rotating said rotatable disc, the center of gravity of the composite system consisting of the rotatable disc and the screen plate being at the axis of rotation of the rotatable disc.

4,317,619

MICROFICHE APPARATUS

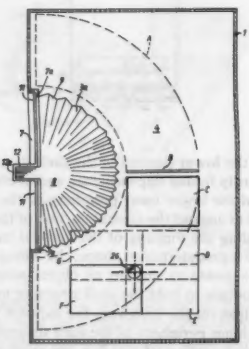
Walter Rauffer, Munich, Fed. Rep. of Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 19, 1980, Ser. No. 150,993

Claims priority, application Fed. Rep. of Germany, May 25, 1979, 2921154

Int. Cl.³ G03B *23/04*

U.S. Cl. 353—25 **9 Claims**



1. In a microfiche apparatus, a combination comprising a microfiche file including a pair of stiff covers and extensible and collapsible means forming a series of microfiche storage pockets between said covers and connected to each other, said series also including two end pockets each connected to one of said covers, said covers and said pockets being turnable between a file closed position in which said covers are parallel to one another and said pockets are collapsed, and a file open position in which said covers are coplanar and said pockets are extended and assume a fan-shaped configuration; a housing having an opening through which said pockets are insertable into said housing in said fan-shaped configuration so that the inner open ends of said pockets face into the housing; and selecting means for withdrawing microfiches from, and restoring them to, said pockets through said inner open ends thereof.

4,317,620

VARIABLE PROPORTIONAL FILL FLASH

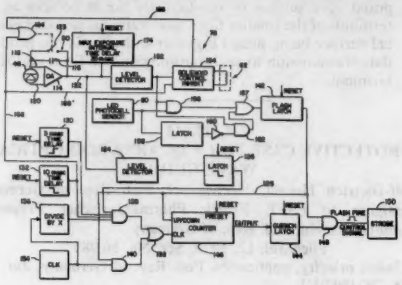
Richard J. Coppa, Westwood; James K. Lim, and Marie T. Rodriguez, both of Somerville, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 17, 1980, Ser. No. 113,042

Int. Cl.³ G03B *7/16, 15/05;* H05B *41/14*

U.S. Cl. 354—33 **17 Claims**

17. In a photographic exposure control system employing a source of artificial illumination during exposure intervals involving both substantial and insignificant levels of ambient light, the improvement comprising means for providing exposures having substantially the same given proportion of ambient to artificial scene light in exposure operations involving ambient scene light levels above a first predetermined level, for providing exposures having substantially all artificial scene light in exposure operations involving ambient scene light levels below a second predetermined level and for providing exposures wherein the proportion of ambient to artificial scene light is progressively reduced from said given proportion to



substantially zero as the ambient light level condition associated with exposure operations effected between said first predetermined level and said second predetermined level decreases.

4,317,621

EXPOSURE CONTROL APPARATUS FOR USE WITH A CAMERA HAVING ELECTRONIC FLASH CONTROLLING CAPABILITY

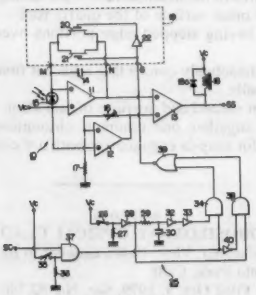
Kazunori Mizokami, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Japan

Filed Mar. 3, 1980, Ser. No. 126,662

Claims priority, application Japan, Apr. 20, 1979, 54/48695

Int. Cl.³ G03B *15/05*

U.S. Cl. 354—33 **7 Claims**



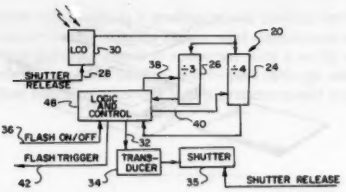
1. An exposure control apparatus for use with a camera, wherein the camera includes a shutter that releases and closes and wherein the camera has the capability of controlling an electronic flash, the exposure control apparatus includes a photometric circuit which effects photometry of light reflected from an object being photographed to determine an exposure period automatically, the photometric circuit being connected for operating the shutter to close upon completion of the exposure period, and the exposure control apparatus further includes a trigger switch which is operated in response to a shutter release to begin operation of the photometric circuit; the exposure control apparatus comprising: a timing circuit which is operable to increase by a predetermined amount a time period from the beginning of the shutter release of the camera to the actuation of the trigger switch to initiate photometry, said timing circuit comprising a mode selection switch for selecting a photographing mode, and a circuit for receiving a charging complete signal that indicates that the electronic flash is capable of being discharged, said mode selection switch and said charging complete signal receiving

circuit cooperating to operate said exposure control apparatus in one of a plurality of predetermined operating modes, said operating modes corresponding to respective photographing modes of the camera and said one operating mode corresponding to the selected photographing mode.

4,317,622
EXPOSURE CONTROL APPARATUS FOR FLASH PHOTOGRAPHY

Lenard M. Metzger, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 16, 1980, Ser. No. 159,420
Int. Cl.³ G03B *7/093, 7/14, 15/03*
U.S. Cl. 354—34 **9 Claims**



1. In a photographic camera adapted for use with a flash unit having a known, unregulated light output and film having a known film speed and exposure latitude, the camera having a flash exposure mode of operation, shutter means for regulating an exposure interval and an objective lens with a predetermined focal length and fixed aperture providing a useable depth of field extending outwardly from a near acceptable image focus point, the flash unit, in an absence of ambient light, providing flash light which exposes the film a predetermined amount when photographing a subject located at the near acceptable image focus point of the lens, the improvement comprising:

means for firing the flash unit independently of the subject range; and

an ambient light exposure control device, coupled to the shutter means, and including means for varying the exposure interval in the flash exposure mode to provide (a) an ambient light exposure which, in the absence of flash light, underexposes the film by a predetermined amount which is within the exposure latitude of the film, and (b) a total ambient light and flash light exposure of the film that is within the exposure latitude of the film throughout the useable depth of field of the lens.

4,317,623
MEMORY USED IN AUTOMATIC EXPOSURE CONTROL MECHANISM

Tsukumo Nobusawa, Tokyo, Japan, assignor to Asahi Kogaku Kohyo Company Limited, Tokyo, Japan

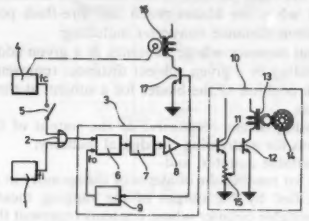
Filed Aug. 29, 1980, Ser. No. 182,767
Claims priority, application Japan, Sep. 3, 1979, 54-111796
Int. Cl.³ G03B *7/00*
U.S. Cl. 354—60 A **10 Claims**

1. In a through-the-lens, single lens reflex camera wherein light reflected from an object to be photographed is intercepted when a quick-release mirror jumps up in response to the depression of a shutter button to one of a plurality of positions, a memory system for supplying a voltage output signal adapted for use in a circuit for controlling the opening and closing of the camera shutter or a circuit for controlling the opening and closing of the camera diaphragm, said system comprising:

first pulse generating means for generating an input pulse signal having a first pulse frequency corresponding to the intensity of light reflected from said object;

a second pulse generating means for generating a reference pulse signal having a second pulse frequency;

third pulse generating means for generating a control pulse signal having a third pulse frequency, said third pulse generating means including means for comparing said third pulse frequency first to said first pulse frequency when said reflected light is not intercepted by said quick release mirror and second with said second pulse frequency when said reflected light is intercepted by said quick-release mirror, for generating said voltage output

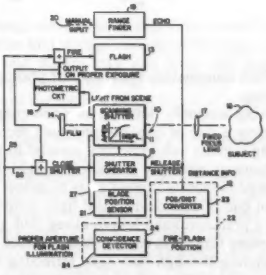


signal having a magnitude corresponding first to the difference in frequency between said first pulse frequency and said third pulse frequency and second to the difference in frequency between said second pulse frequency and said third pulse frequency, and for adjusting the frequency of said control pulse signal and the frequency of said reference pulse signal in response to the magnitude of said voltage output signal to cause said frequencies of said control pulse signal and said reference pulse signal to coincide with the frequency of said input pulse signal.

4,317,624
STROBE CAMERA HAVING RANGE CORRELATED SCANNING BLADE ENDODING

Edwin K. Shenk, Westford, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 3, 1980, Ser. No. 203,125
Int. Cl.³ G03B *15/03*
U.S. Cl. 354—139 **14 Claims**



1. Apparatus for actuating a flash unit on a camera that includes a scanning shutter having displaceable apertured blades which upon displacement establish a varying exposure aperture, ranging means for producing an output representative of the distance from the flash unit to a subject being photographed, and means for actuating the shutter to displace the blades, said apparatus comprising:

blade position sensing means responsive to displacement of the blades in said one direction for producing an output representative of the instantaneous position of the blades; and

flash actuating means for triggering the flash unit to produce

a pulse of light in response to both the output of the ranging means and the blade position sensing means so as to produce said light pulse at an aperture functionally related to subject distance, said flash actuating means including a position/distance converter responsive to the output of the ranging means for producing a representation of the fire-flash position of the blades in accordance with a predetermined relationship between aperture value and subject distance for proper exposure of the subject, and coincidence detection means responsive to the output of the blade position sensing means and to the representation of the fire-flash position of the blades for actuating the flash unit when the blades reach said fire-flash position, said position/distance converter including:

a digital memory whose contents, at a given address corresponding to a given subject distance, represents the fire-flash position of the blades for a subject at the given distance;

addressing means responsive to the output of the ranging means for addressing the digital memory;

a presettable counter; and

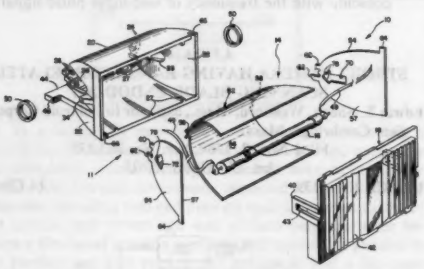
means for reading the contents of the memory at the address specified by the output of the ranging means into the presettable counter whose contents represent the fire-flash position of the blades corresponding to the distance of the subject as represented by the output of the ranging means.

4,317,625

STROBE REFLECTOR ASSEMBLY

David Van Allen, Malden, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Aug. 4, 1980, Ser. No. 175,250
Int. Cl.[3] G03B *15/02*
U.S. Cl. 354—145 **13 Claims**



1. A flash illumination apparatus for photographic apparatus comprising:

a housing assembly defining an open-ended cavity and including a pair of opposed end wall sections spaced apart along a given axis generally parallel to the open end;

said housing assembly including a light reflective surface located interiorly thereof so as to reflect light through the open end of said cavity, said light reflective surface having a predetermined length along said given axis;

an opening formed in each of said opposed wall sections and extending through said light reflecting surface to permit passage therethrough of an illumination tube;

an energizable illumination tube having a portion of preselected length and being movable for longitudinal centering thereof relative to said predetermined reflector length to facilitate optimum light distribution by the light reflecting surface, said tube having opposite end portions of given lengths projecting from said openings to permit attachment of electrical leads thereto;

means for defining a reference surface on the exterior of at least one of said housing end wall sections for allowing accurate positioning of said preselected tube length relative to said predetermined reflector length to facilitate optimum light distribution, said reference surface being spaced a predetermined distance from the adjacent end of said predetermined reflector length such that when one end portion of said tube and said one housing end wall section generally simultaneously engage a contact means said reference surface allows said preselected tube length to be accurately centered in said reflecting surface; and

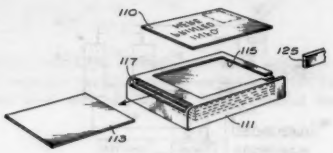
means for securing said tube to said housing assembly.

4,317,626

PHOTO-IDENTIFICATION CARD PACK

Gerald M. Poshkus, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 5,406, Jan. 22, 1979, Pat. No. 4,245,035.
This application Nov. 13, 1979, Ser. No. 93,343
Int. Cl.[3] G03C *1/40*; G03B *19/10*; G03D *9/00*; G03C *1/48*
U.S. Cl. 354—180 **2 Claims**



1. A pack of instant, liquid-developable, photo-identification cards; said pack comprising:

a casing including an exposure aperture and an exit slot;

a plurality of photo-identification cards in said casing, each of said cards comprising:

a thin, plate of polymeric material and having opposed parallel faces, and an open section extending between said faces, at least one of said faces being adapted for carrying information,

a piece of film in said open section, said film piece being photographically exposable to record a latent image developable by liquid to establish a visible image,

first and second transparent, panels of polymeric material covering said faces of said plate, including the open section for protecting said film piece from alteration, said first and second panels being laminated to said plate by permanent polymeric material to polymeric material bonds, and

port means for introducing developing liquid to said piece of film; and

a template extending over the exposure aperture of said casing and carrying information sequentially exposable onto the pieces of film in the cards in said casing.

4,317,627

INDEX MECHANISM FOR COUPLING CONTROL OF OPERATIONAL LENS UNITS

Takashi Isobe, Tokyo, and Masao Aoyagi, Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 949,522, Oct. 10, 1978, abandoned.
This application Jun. 13, 1980, Ser. No. 159,310
Claims priority, application Japan, Oct. 15, 1977, 52-123681
Int. Cl.[3] G03B *17/14, 7/02*
U.S. Cl. 354—286 **15 Claims**

2. A lens assembly for a camera comprising:

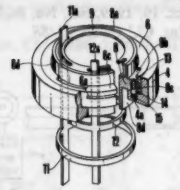
(a) lens barrel means having coupling means for engaging with complementary coupling means on said camera for mounting said lens assembly on said camera;

(b) adapter means rotatable relative to said lens barrel means, said adapter means being arranged to be held in a predetermined positional relationship relative to said lens barrel means when said lens barrel means is dismounted from said camera;

(c) retainer means adapted to cooperate with complemen-

tary retainer means on said camera for holding said adapter means rotatively fixed relative to said camera; and

(d) detachment enabling means for permitting detachment of said lens assembly from said camera when said lens barrel



means is brought to a predetermined position by rotation relative to said adapter means, said detachment enabling means being arranged to cooperate with a recess which is provided on said camera, and to pass through said recess when said lens assembly is in a predetermined position.

4,317,628

ELECTRIC CIRCUIT PROTECTION DEVICE FOR CAMERA

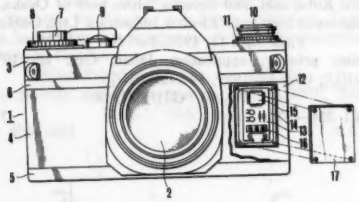
Masami Shimizu, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 6, 1980, Ser. No. 175,714

Claims priority, application Japan, Aug. 6, 1979, 54-108250[U]; Aug. 6, 1979, 54-108251

Int. Cl.³ G03B *17/02*

U.S. Cl. 354—288 **7 Claims**



1. An electric circuit protection device for a camera, comprising:

a camera body including an outer wall for forming the exterior of said camera body and an inner wall inside said camera body;

said outer and said inner walls forming a void space in said camera body and having a number of openings leading out from said void space;

a circuit board disposed within said void space including electric parts and an integrated circuit;

electric circuits including other electric parts disposed outside of said void space and within said camera body, and means passing through said openings for connecting said electric circuits and said other electric parts to said circuit board within said void space; and

seal means arranged to seal each of said openings and to permit said circuit board to be electrically connected to said electrical circuits and said other electric parts, and for sealing said void space into a tightly closed state.

4,317,629

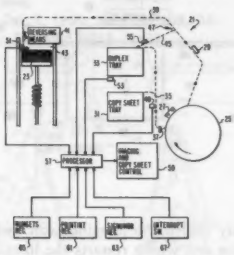
JOB RECOVERY METHOD AND SYSTEM

Roger E. Kuseski, Longmont, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 4, 1980, Ser. No. 118,361

Int. Cl.³ G03B *27/32, 27/52;* G06F *1/00*

U.S. Cl. 355—24 **20 Claims**



1. A method for job recovery for a copying system in which duplex copies are normally generated by initially sequentially feeding copy sheets to a copying area for copying on one side of said sheets, storing said sheets in a duplex tray after copying has occurred on said one side, feeding said copy sheets in said duplex tray to said copying area for copying on the other side of said sheets, and then collecting said sheets twice fed through said copying area at an exit station, said method comprising:

maintaining a count of copy sheets in said duplex tray and a count of copy sheets at said exit station;

determining upon occurrence of predetermined copy sheet failure during copying on said other side of said copy sheets, at least in part from said counts, copies lost due to said failure; and

utilizing said determination of copies lost to generate replacement copies prior to continuing normal duplex copy generation after said copy sheet failure has occurred.

14. A system for printing duplex copies without loss due to predetermined copy sheet failure, said system comprising:

printing means for printing images on copy sheets at a printing area;

storage means for storing copy sheets;

a duplex tray;

means for causing movement of said copy sheets in a copy sheet path from said storage receptacle through said printing area to said duplex tray and from said duplex tray through said printing area to an exit station;

first sensor means for maintaining a count of copy sheets in said duplex tray;

second sensor means for maintaining a count of copy sheets received at said exit station; and

processing means connected with said first and second sensor means to determine copy sheets lost due to jams occurring during normal printing of duplex copies and for causing replacement copies to be printed prior to resumption of normal copy printing including generating replacement copies when copy sheets are lost during copying on sheets withdrawn from said duplex tray.

4,317,630

COPYING MACHINE

Norio Kokaji, Hino, and Nobuyuki Shimada, Kokubunji, both of Japan, assignors to Iwatsu Electric Co., Ltd., Tokyo, Japan

Filed Oct. 22, 1980, Ser. No. 199,622

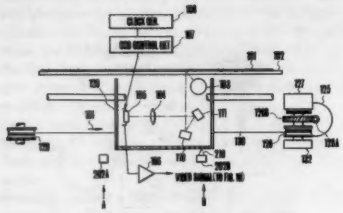
Claims priority, application Japan, Oct. 26, 1979, 54-138301

Int. Cl.³ G03G *15/28*

U.S. Cl. 355—50 **3 Claims**

1. A copying machine comprising imaging scan means for scanning and imaging a master to produce a master image, latent image forming means for forming, on a recording me-

dium, a latent image of the master, position sensor means for sensing the position of the imaging scan means, and controller means which receives a detection signal generated from the position sensor means during scan of the master to temporarily stop the operation of the latent image forming means when the imaging scan means reaches an intermediate position and simultaneously return the imaging scan means to an imaging start position and which restarts the imaging operation from the start position and the latent image forming operation from the position where the latent image forming means has temporarily stopped to an ultimate stop position, whereby more than two identical copies can be reproduced from the same master on a single sheet of copy paper.



4,317,631

METHOD AND APPARATUS FOR MEASURING ATTENUATION IN LIGHT WAVEGUIDES FOR COMMUNICATIONS TRANSMISSION PURPOSES

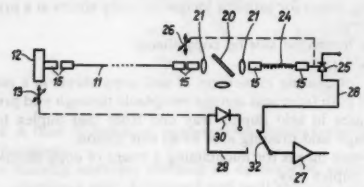
Peter Fröscher, and Joachim Schulze, both of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 27, 1979, Ser. No. 79,599

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1978, 2848930

Int. Cl.³ G01N *21/59, 21/84*

U.S. Cl. 356—73.1 **16 Claims**



1. The method for measuring the attenuation in a test piece of light waveguide used for communications transmission purposes, the test piece having an input and an output, in an apparatus having a test transmitter and a measuring section comprising a test photo diode coupled to a receiver, the apparatus having simplified coupling of the transmitter to the input of the test piece and of the output of the test piece to the measuring section, the coupling of the transmitter to the test piece and of the test piece to the measuring section being separately adjustable, which comprises the steps of:

providing a large area photo receiver having an output signal,

coupling the large area photo receiver to the light path at the output of the test piece;

adjusting the coupling between the transmitter and the input of the test piece to optimize coupling to the test piece by means of the photo receiver; and

measuring the attenuation by means of the measuring section coupled to the light path at the output of the test piece.

4,317,632

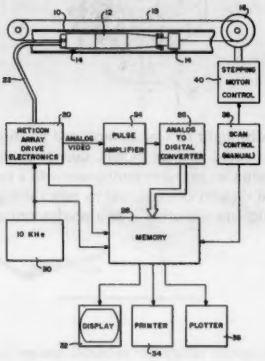
METHOD AND MEANS FOR OPTICAL INSPECTION OF THE INTERIOR SURFACE OF TUBING

Victor J. Orphan, Leucadia, and Robert O. Ginaven, Encinitas, both of Calif., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Oct. 19, 1979, Ser. No. 86,572

Int. Cl.³ G01N *21/88*

U.S. Cl. 356—241 **8 Claims**



1. Means for inspecting and imaging the interior surface of a tube and the like comprising a light source, photodiode array means for receiving light and generating an electrical signal in response thereto, means for directing light onto said means for receiving light, and carrier means for supporting and moving said light, said means for receiving light, and said means for directing light.

4,317,633

DEVICE FOR DETECTING THE SURFACE UNEVENNESS OF WIRE-SHAPED MATERIAL

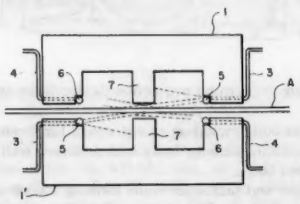
Takashi Kobayashi, and Etsurou Nitta, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Apr. 11, 1980, Ser. No. 139,528

Claims priority, application Japan, Oct. 12, 1979, 54-142002[U]; Oct. 12, 1979, 54-142003[U]

Int. Cl.³ G01N *21/84*

U.S. Cl. 356—371 **7 Claims**



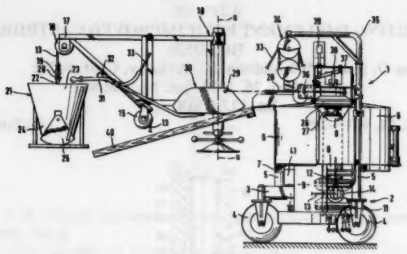
1. A device for detecting the surface unevenness of a wire-shaped body which is covered with an insulating material comprising: at least one light projecting section and at least one light receiving section arranged along said wire-shaped body in such a manner that an incident angle of light projected by each said light projecting section onto said insulating material is larger than the critical angle thereof, each said light projecting section and each said light receiving section comprising a glass fiber sensor having a rod lens and at least one glass fiber, said rod lens having a longitudinal axis disposed orthogonal to the longitudinal axis of said at least one glass fiber.

4,317,634

MACHINE

Viktor Zupancic, Cesta v gorice 10/D, 61000 Ljubljana, and Joze Miklavcic, Oslica 13, 61295 Ivancna gorica, both of Yugoslavia

Filed Aug. 15, 1979, Ser. No. 66,540
Claims priority, application Yugoslavia, Aug. 18, 1978, 1978/78
Int. Cl.³ B28C 5/00; B66D 1/26
U.S. Cl. 366—1 28 Claims



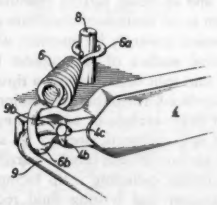
1. A machine comprising a chassis, a carrying frame located on said chassis, a plurality of driven working implements supported on said carrying frame, at least one common main drive having a main drive shaft supported on said carrying frame, a connecting shaft non-rotatably connecting at least one of the working implements directly to the main drive shaft, at least one non-positive clutch associated with at least one of the respective working implements which cooperate with the connecting shaft to engage or disengage said working implement with said connecting shaft, and control means connected to said non-positive clutch for engaging and disengaging said working implement with said connecting shaft as desired.

4,317,635

MATRIX PRINTING HEAD

Roland Englund, Stockholm, and Tommy Wincent, Upplands Väsby, both of Sweden, assignors to Svenska Kassaprinter AB, Sundbyberg, Sweden

Filed Feb. 7, 1980, Ser. No. 119,224
Claims priority, application Sweden, Feb. 13, 1979, 7901264
Int. Cl.³ B41J 3/12
U.S. Cl. 400—124 4 Claims



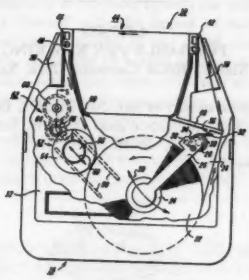
1. A matrix printing head, comprising:
at least one printing needle;
an electromagnet provided with an armature to which an end of said printing needle is pivotally connected and which moves the printing needle towards a printing position;
spring means for restoring the printing needle in a direction away from said printing position;
said printing needle end being connected said armature by means of said spring means;
said printing needle end being provided with a curved portion forming a holder for said spring means;
said curved portion also being pivotably supported by a groove formed in said armature.

4,317,636

RIBBON CARTRIDGE

James G. Hume, Hayward, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 3, 1980, Ser. No. 165,514
Int. Cl.³ B41J 25/38
U.S. Cl. 400—208 7 Claims



1. A ribbon cartridge for use in impact printers, including a housing having substantially planar opposed walls between which there is enclosed a supply spool, a take-up spool and a length of inked ribbon mounted upon said supply spool and extending in a path out of said housing across an impact zone and back into said housing to said take-up spool, said cartridge being characterized by comprising
drive means in contact with the surface of said take-up spool for rotating said spool, said drive means having a fixed center about which it rotates,
a pivot arm fixed at one end and supporting upon its opposite, arcuately movable, end said supply spool for movement in an arc while allowing said supply spool to rotate about its center,
guide means in said housing for confining said take-up spool for floating movement along a path between said supply spool and said drive means while allowing said takeup spool to rotate about its center, and
means for urging said supply spool for arcuate movement toward and against said take-up spool and for urging said take-up spool along its path of movement into contact with said fixed center drive means.

4,317,637

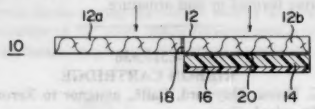
TYPEWRITER RIBBON INCLUDING A CORRECTION STRIP

Shubun Sakurai, 6-24 Matsusato-Otokoyama, Yawata-City, Kyoto Pref., and Hiroyuki Goda, 1-104 Kuisehonmachi, Amagasaki-City, Hyogo Pref., both of Japan

Filed Dec. 14, 1979, Ser. No. 103,723
Claims priority, application Japan, Dec. 18, 1978, 53-174523[U]; Dec. 18, 1978, 53-174524[U]
Int. Cl.³ B41J 31/02
U.S. Cl. 400—240.1 2 Claims

1. A typewriter ribbon comprising:
a base strip made of a fiber texture and having two portions longitudinally divided by a barrier filling, one of which being black-inked and the other of which being ink-free,
each of said portions being of substantially the same thickness and composed of a thermoplastic resin,
a correction strip, including a white transfer layer, fixedly attached to the opposite face of said ink-free portion of said base strip with respect to a typing direction so that

said correction strip is substantially superimposed on the entirety of said ink-free portion, and



said correction strip is attached to said ink-free portion by means of an adhesive disposed therebetween and around the central portion thereof.

4,317,638

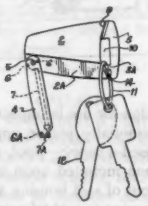
FOLDABLE PEN KEY RING

Michael C. Klaber, 10526 Caminito Obra, San Diego, Calif. 92126

Continuation-in-part of Ser. No. 966,892, Dec. 6, 1978, abandoned. This application Jan. 21, 1980, Ser. No. 114,095

Int. Cl.³ B43K *29/00, 29/12*

U.S. Cl. 401—195 **4 Claims**



1. A foldable tool usable as a key holding ring and message carrying tag which comprises:

a generally flat oblong body;

a ball point pen-holding elongated member, having first and second ends, which member in the folded position defines a first mode in which same is placed in stored position contiguously to a first side of said body;

means for pivotally connecting the first end of said member to a first corner of said body such that said member is pivotal between said first mode and a second mode in which said pen-holding member is extended from said body for use;

on the body, a projection extending in a generally arcuate direction from a second corner of the body diagonally opposite to said first corner, toward a third corner of the body adjacent to said first side;

said projection being shaped and dimensioned to leave a gap between it and a second side of the body joining said second and third corners;

means for restricting said gap to a narrow channel between the extremity of said projection and said third corner;

said channel being narrower than a key ring and said projection being sufficiently resilient to permit expansion of said channel by pressing a ring therethrough to snap said ring into or out of said gap; and

means on said member comprising the tip of a pen held thereby for positively closing said channel when said member is in its first mode placed in the folded position alongside said body and including locking means between said body and said member comprising detents interlockingly engageable on said first end of said member and said body which hold the member in either open or closed position, whereby in said first mode a key ring engaged in said gap by said member is positively locked therein by said member, and in said second mode a key ring engaged in said gap is non-positively retained therein to permit free use of the pen held by said member with a ring either retained on said projection or snapped off through said channel free of said projection.

4,317,639

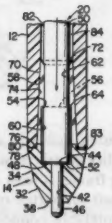
WRITING IMPLEMENT WITH IMPROVED CARTRIDGE HOLDER

Dane D. Kato, 1400 Addison St., Berkeley, Calif. 94702

Filed Dec. 26, 1979, Ser. No. 106,933

Int. Cl.³ B43K *7/10*

U.S. Cl. 401—209 **6 Claims**



1. A writing implement having:

a writing cartridge having a writing tip assembly and a writing fluid receptacle connected thereto; said writing fluid receptacle having an outer surface and extending over a portion of said writing tip assembly, said writing tip assembly having a back end within said writing fluid receptacle which forms a lip on said outer surface of said writing fluid receptacle,

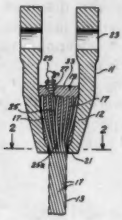
a tubular barrel for enclosing at least said writing fluid receptacle of said writing cartridge, said tubular barrel having first and second ends, said first end including an interior frustroconical surface which tapers inwardly as it extends toward said second end;

a barrel tip having a tip surface on one end thereof and a split collar at the opposite end, said split collar having an inner surface being frustroconical in shape tapering inwardly as it extends toward said tip surface when in an unstressed condition and sized to mate with a portion of said writing cartridge, and an outer surface essentially cylindrical in shape when in an unstressed condition and sized to mate and be stressed inwardly by insertion within said interior frustroconical surface of said tubular barrel, said inner surface of said split collar having a tipward facing radial abutment surface formed therein positioned to engage said lip on said outer surface of said writing fluid receptacle when said split collar is stressed by said interior frustroconical surface of said tubular barrel, said writing tip assembly further including a tip facing radial abutment surface adjacent said writing fluid receptacle and said barrel tip further including a barrel facing radial abutment surface positioned for engagement with said barrel, at least one slit defined in said split collar, said slit having an extension groove which extends across said barrel facing radial abutment surface to vent said barrel, and a radial abutment surface positioned to abut said tip facing radial abutment surface of said writing tip assembly whereby said writing cartridge is retained between said tipward facing radial abutment surface of said split collar and said radial abutment surface of said barrel tip.

4,317,640
FATIGUE AND CORROSION RESISTANT FLEXIBLE WIRE STRAND ASSEMBLY

Richard C. Peeling, Montoursville, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Jun. 9, 1980, Ser. No. 157,699
Int. Cl.³ F16C *11/00*; F16D *1/12*
U.S. Cl. 403—36 **10 Claims**

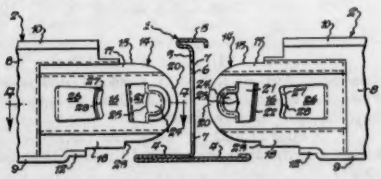


1. A fatigue and corrosion resistant flexible linear assembly comprising:
(a) a plurality of wires stranded together to form a flexible wire strand,
(b) a poured socket attachment secured to an end of the wire strand by means of a solidified liquid contained in the bowl of the socket attachment,
(c) a hollow tube having an external diameter less than the diameter of at least two adjacent individual wires comprising the wire strand, said hollow tube extending from the surface of the solidified liquid body within the bowl of the socket attachment, through the solidified liquid and in the interstice between the said two adjacent wires in substantial contact with each other and at least one other wire at the base of the socket attachment and exiting from the solidified liquid body at the base of the socket attachment near the center of the wire strand in a position such that a viscous fluid lubricant injected at the top of the hollow tube will be expelled from the lower end of the hollow tube into the center of the wire strand adjacent to the base of the socket fitting whereby the portion of the strand adjacent to the base of the socket attachment may be lubricated.

4,317,641
LOCKING CONNECTION FOR SUPPORTING GRID SYSTEMS

Gale E. Sauer, Williamsville, N.Y., assignor to Roblin Industries, Inc., Buffalo, N.Y.

Filed May 5, 1980, Ser. No. 146,436
Int. Cl.³ F16B *7/22*
U.S. Cl. 403—347 **10 Claims**

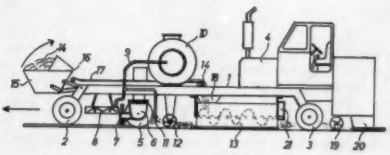


1. A locking connection for supporting grid systems comprising a first support member having a flange and a web upstanding therefrom, said web having a slot therein, a pair of second support members each having a flange and a web upstanding therefrom, said second member webs being provided with axially projecting locking connectors insertable from opposite directions through said slot in side-by-side relation, each of said connectors having a resiliently yieldable finger engageable against said first member web after insertion through said slot for interlocking said first and second members together, and means interlocking said connectors together in an assembled relation preventing relative separating movement of said second members away from each other, said last-named means comprising, for each connector, a detent projecting laterally from the side of said connector opposite said finger, means defining an opening in said connector providing an arcuate generally vertical shoulder axially spaced rearwardly from said detent, and a spring retainer projecting laterally from the same side of said connector as said detent and extending forwardly at least partially across said opening and toward said shoulder, whereby when said connectors are inserted through said slot in side-by-side relation the forward end of each connector is confined against the other connector by the retainer thereof with the detent of each connector engaging the arcuate shoulder of the other connector, said retainers yielding resiliently to permit passage of said detents into said openings for engagement with said shoulders, said arcuate shoulders accommodating relative generally vertical angular movement of said second support members, and said retainers resiliently retaining said detents and shoulders engaged upon relative generally horizontal and vertical angular movement of said second supporting members.

4,317,642
METHOD AND APPARATUS FOR ABRADING AND RECOATING ROAD PAVEMENTS

Reinhard Wirtgen, Hohner Strasse, 5461 Windhagen, Linz, Fed. Rep. of Germany

Filed Nov. 19, 1979, Ser. No. 95,611
Claims priority, application Fed. Rep. of Germany, Nov. 20, 1978, 2850344
Int. Cl.³ E01C *3/06*
U.S. Cl. 404—72 **23 Claims**



1. A method for abrading and recoating road pavements, comprising the steps of:
determining the composition of the road pavement material which is to be renewed by sampling and analyzing the same;
peeling or milling the road pavement material which is to be renewed from the road;
collecting the peeled or milled road material and heating the same if desired;
mixing the collected material with additional aggregate components of a type and in an amount determined by the composition of the road pavement material to be renewed; and
applying the collected material and components mixed therewith to the road as a new pavement.

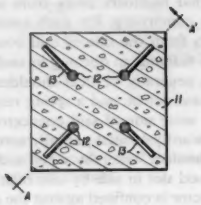
4,317,643
STEEL REINFORCED CONCRETE PILES

Donald S. Miller, 406 Janneys La., Alexandria, Va. 22302

Filed Nov. 14, 1979, Ser. No. 94,173
Int. Cl.³ E02D *5/34*; E04B *1/16*
U.S. Cl. 405—256 **7 Claims**

1. In a reinforced concrete pile having a plurality of steel reinforcing cables, the improvement comprising the presence of at least one ferrous metal alloy electrically conductive rod per cable, said rod being perpendicular to, and projecting

outward from, the axis of the cable, the inner end of each said rod being in substantial electrical contact with said cable, the



outer end of each said rod projecting outward to within 0.5 to 1.5 inches beneath the surface of the pile.

4,317,644

MACHINE TOOL PROFILING DEVICE

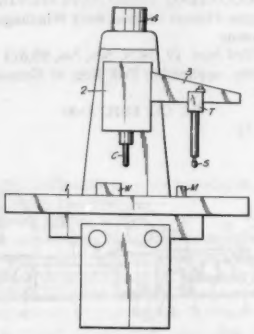
Toshiaki Hosoi, 10, 9, Kamiminami 5-chome, Hirano-ku, Osaka-shi, Osaka, Japan

Filed Mar. 26, 1979, Ser. No. 23,746

Claims priority, application Japan, Mar. 24, 1978, 53-34703

Int. Cl.³ B23Q *35/12*

U.S. Cl. 409—98 **23 Claims**



1. A profiling device for contour profiling, comprising:

(A) a horizontal planar surface work table; and

(B) a frame member extending vertically from, and connected to, said table;

(C) a spindle head frame casing movably connected to said frame member at a position above said table, said casing having contained therein a vertically positioned spindle;

(D) a tracer arm member connected to said spindle head frame casing so as to extend from said casing, said arm extending over a portion of said table;

(E) a tracer head frame casing connected to said arm at a position above said table, said casing having contained therein a vertically positioned tracer spindle, supported within said casing by an upper support member and a lower support member in such a manner so as to permit slight inclination from its vertical position and so as to further permit free rotation;

(F) a spindle inclination detecting unit in connection with said spindle, said detecting unit providing a means to detect spindle inclination in an analog fashion by means of a differential transformer wherein the degree of inclination is detected from the change in rotational speed of said spindle and wherein the degree of spindle inclination is connected to a vertical movement of a displacement bar in connection with said differential transformer;

(G) a work table shift command plate supported concentrically with said spindle so as to permit the rotation of said plate at the same speed as said spindle, said plate having an outer periphery having a smooth curvature symmetrical to the straight line which passes through said plate and intersects at a right angle with the center of rotation of said plate, said line coinciding with a second straight line connecting a center of said stylus with a center of said spindle;

(H) two pairs of work table shift detecting means located at equal intervals about the circumference of said spindle at a position corresponding to the outer periphery of said command plate, said shift detecting means being interconnected so as to generate signals according to the relative displacement of said detecting means on the periphery of said command plate; and

(I) a means for moving a portion of said work table in two directions which intersect with each other at right angles, said means for moving being in connection with, and responding to, said signals from said table shift detecting means.

4,317,645

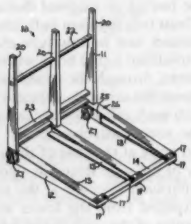
CARGO RETAINER

James J. Van Gompel, Fremont, Ind., assignor to N. P. Marketing Corporation, Neenah, Wis.

Filed Jul. 11, 1980, Ser. No. 168,670

Int. Cl.³ B61D *45/00*

U.S. Cl. 410—94 **10 Claims**



10. In a device for restraining a cargo load, an elongated floor contacting member provided with an upwardly facing load bearing surface, said member being adapted to project forwardly beneath a portion of the cargo load, a generally upright member secured to the floor contacting member in spaced relation from the forward end of the floor contacting member for engaging with the cargo load, and a floor piercing element movably mounted on the floor contacting member adjacent to the rearward end thereof, said floor piercing element being normally disposed to pierce the floor when the floor contacting member of the restraining device is under load in service and being movable to a position incapable of piercing the floor when the restraining device is out of service.

4,317,646

GAS TURBINE ENGINES

Thomas Steel, Littleover; Noel H. Hooke, Etwall, and George Pask, Stanton-by-Bridge, all of England, assignors to Rolls-Royce Limited, London, England

Filed Feb. 22, 1980, Ser. No. 123,777

Claims priority, application United Kingdom, Apr. 26, 1979, 14606/79

Int. Cl.³ F01D *11/08*

U.S. Cl. 415—116 **6 Claims**

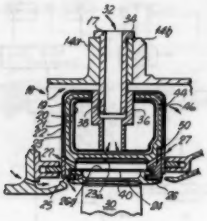
1. In a gas turbine engine, the improvement in structure for controlling clearance between blade tips of a turbine rotor having a predetermined rate of expansion and shroud means surrounding the blade tips, the combination comprising:

an engine casing;

a hollow annular control ring concentrically positioned within said casing;

a plurality of shroud segments defining said shroud means about the blade tips of the turbine rotor, said shroud segments being secured to said hollow annular control ring for expansion and contraction with the same;

means operatively supporting said hollow annular control ring and the shroud segments supported thereby from said casing while mechanically isolating said control ring from deformation or expansion of said casing, said support means permitting said control ring to expand and contract independently of said casing while being maintained con-



centric with the same, and said support means providing means to supply a fluid to the interior of said hollow annular control ring, and means thermally insulating the exterior of said hollow annular control ring, said thermally insulating means and said support means cooperating to control the rate of expansion of said control ring to match the rate of expansion of the turbine rotor whereby clearance between the shroud means and the blade tips of the turbine rotor is a predetermined amount during at least a portion of the operating cycle of the engine.

4,317,647
DOSING SYSTEM

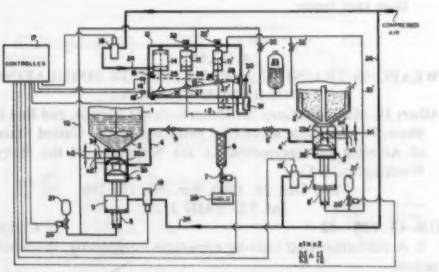
Erhard Häuser, Schöffengrund, Fed. Rep. of Germany, assignor to Wilhelm Hedrich Vakuumanlagen GmbH & Co. KG, Ehringshausen, Fed. Rep. of Germany

Filed Dec. 12, 1979, Ser. No. 102,926

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1978, 2854687

Int. Cl.³ F04B *17/00, 35/00*

U.S. Cl. 417—339 **13 Claims**



1. A dosing system for a fluent material, said system comprising:

a support;

a lever pivoted on said support at a pivot;

a hydraulic master cylinder connected between said support and an attachment location on said lever at a distance from said pivot, whereby on pivoting of said lever said master cylinder is moved through a stroke;

a hydraulic slave cylinder remote from said master cylinder;

a hydraulic conduit connecting said master cylinder to said slave cylinder for joint and synchronous operation of said slave cylinder with said master cylinder;

a stroke-type dosing pump connected to said slave cylinder for joint displacement therewith and having a piston, an intake, and an output, said pump being adapted and arranged to pump from the respective output a volume directly proportionate to the stroke through which said piston is actuated in a forward direction by said slave cylinder;

a supply of said fluent material connected to said intake;

a power cylinder connected between said lever and said support; and

control means for pressurizing said power cylinder and thereby displacing said slave cylinder and pump through strokes proportionate to said distance and for depressurizing said power cylinder and actuating said piston in a backward direction opposite said forward direction independently of operation of said cylinders.

4,317,648
APEX SEAL FOR ROTARY PISTON ENGINES WITH SEPARATE SEALING AND SUPPORT PIECES

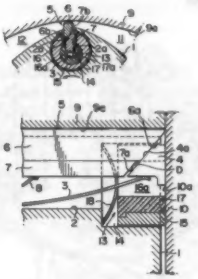
Kazuma Shimizu, and Haruhiko Satow, both of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Nov. 13, 1979, Ser. No. 93,435

Claims priority, application Japan, Nov. 13, 1978, 53/156529[U]; Jan. 22, 1979, 54/6740[U]; Jan. 22, 1979, 54/6741[U]

Int. Cl.³ F01C *19/04, 19/08*

U.S. Cl. 418—120 **7 Claims**



1. A rotary piston engine including a casing which comprises a rotor housing having an inner wall of trochoidal configuration and a pair of side housings secured to the opposite sides of the rotor housing to define a rotor cavity in the casing,

a rotor of substantially polygonal configuration disposed in said rotor cavity for rotation with apex portions in sliding engagement with the inner wall of the rotor housing,

apex seal means comprising an elongated sealing piece, an elongated support piece, and at least one side piece,

said sealing piece being of a relatively small dimension with respect to the size of the rotor in a radial direction of the rotor in order to have flexibility in the radial direction of the rotor,

said sealing and support pieces being disposed in a sealing groove formed in the apex portion of the rotor in a superposed relationship substantially throughout their lengths with said sealing piece faced to the inner wall of the rotor housing,

said sealing and support pieces being independent of each other and freely slidable with respect to each other in the rotating direction of the rotor, said support piece being of a substantially rectangular cross-section having a diametrical height greater than a width thereof and being provided at a radially outward edge with a surface which is inclined radially inwardly as seen in direction of rotation of the rotor, said sealing piece being of a cross-section having a diametrical height greater than a width thereof and being provided at a radially inward edge with a sur-

face which is inclined so as to correspond to the said inclined surface of the support piece, said inclined surfaces being spaced from a bottom surface of the support piece,

said side piece being provided at least at one end of the sealing and support pieces and having an inclined axially inward surface,

said sealing and support pieces having end surfaces which are inclined so as to correspond to the inward surface of the side piece,

the end surface of the sealing piece being in engagement with the inward surface of the side piece, and

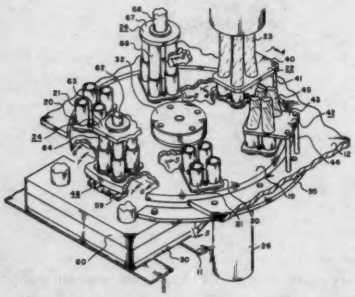
the end surface of the support piece being spaced from the inward surface of the side piece to provide a slight gap therebetween, and

spring means disposed between the support piece and the sealing groove to bias the sealing and support pieces toward the inner wall of the rotor housing.

4,317,649
PELLET MOLDING APPARATUS

Horst E. Boellmann, Delran, N.J., assignor to Per-Fil Industries, Burlington, N.J.

Filed May 12, 1980, Ser. No. 148,918
Int. Cl.³ A01J *21/00*
U.S. Cl. 425—150 **13 Claims**



1. Apparatus for molding pellets from powdered material comprising:

an index table;

a plurality of vertically disposed hollow mold assemblies open at their top and bottom ends positioned upon the index table in a predetermined array;

at least one mold filling station assembly adapted to dispense a metered amount of powder into a given mold assembly from the top of the mold assembly as the same is indexed with the filling station assembly;

a pressing station assembly adapted to compress the powder within a mold assembly into a pellet as the mold assembly is indexed with the pressing station assembly;

an ejection station assembly adapted to eject the pellet from the mold assembly downwardly through the bottom end as the same is indexed with the ejection station assembly;

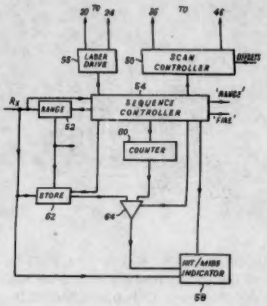
mold closure means adapted to close the mold assembly bottom ends between the filling station and pressing station and open the bottom ends of the mold assemblies at the ejection station; and

index drive means for driving the index table in predetermined increments to align the mold assemblies sequentially with the filling station assembly, pressing station assembly and ejection station assembly.

4,317,650
WEAPON TRAINING SYSTEMS

Derek J. Lee, Farnborough, and James L. C. Livingstone, Cove, both of England, assignors to The Solartron Electronic Group Limited, Farnborough, England

Filed Sep. 10, 1979, Ser. No. 74,207
Claims priority, application United Kingdom, Sep. 13, 1978, 36659/78
Int. Cl.³ F41G *3/26*
U.S. Cl. 434—16 **20 Claims**



1. A method of incorporating a probability factor in an assessment of the accuracy of aim of a weapon, comprising the steps of:

generating a variable whose value changes with time at a rate related to a characteristic of ammunition the use of which is to be simulated by varying through a range including the minimum and maximum values of the probability factor in a pseudo-random manner relative to the time interval between successive aimings of the weapon;

determining whether the weapon has been substantially optimally aimed in relation to a target; and

modifying each assessment of accuracy in accordance with the current value of said variable, including the steps of:

comparing the value of said variable with said probability factor; and

assessing the aim as being accurate only if the weapon has been substantially optimally aimed and said value is less than said factor.

4,317,651
WEAPONS TRAINING APPARATUS FOR SIMULATING LONG RANGE WEAPONS

Albert H. Marshall; Gary M. Bond, both of Orlando, and Bon F. Shaw, Winter Park, all of Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 21, 1980, Ser. No. 199,156
Int. Cl.³ F41G *3/26*
U.S. Cl. 434—22 **17 Claims**

1. A marksmanship training apparatus comprising, in combination:

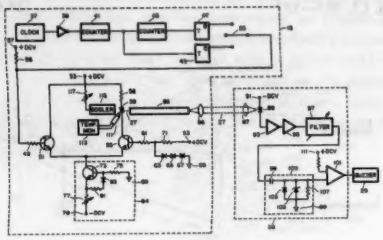
an imitation weapon having a barrel, and a trigger mechanism, said trigger mechanism having an input and an output;

transmitting means mounted within the barrel of said imitation weapon, and having an input connected to the output of said trigger mechanism, and an output adapted for broadcasting along a predetermined optical path a collimated square wave beam of laser light, said square wave beam of laser light having a predetermined frequency;

sensing means spatially disposed downstream from said transmitting means, and having an input adapted for detecting the collimated pulsed beam of laser light broadcast along said predetermined optical path, and for producing

at the output thereof a square wave signal whenever the square wave beam of laser light broadcast along said predetermined optical path is detected thereby, said square wave signal having a frequency the same as the frequency of said square wave beam of laser light;

filtering means having an input connected to the output of said sensing means, and an output for providing at the output thereof a sinuosidal waveform signal in response to the square wave signal produced by said sensing means,



said sinusoidal waveform signal having a frequency that is identical to that of said square wave signal;

means having an input connected to the output of said filtering means, and an output for shifting the voltage level of said sinusoidal waveform signal; and

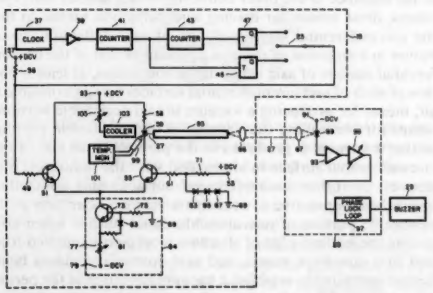
comparing means having an input connected to the output of said voltage level shifting means, and an output for producing at the output thereof a series of pulses with each pulse being provided thereby only when said sinusoidal waveform signal exceeds a predetermined voltage level.

4,317,652

MARKSMANSHIP TRAINING DEVICE FOR SIMULATING LONG RANGE WEAPONS

Albert H. Marshall; Gary M. Bond, both of Orlando, and Bon F. Shaw, Winter Park, all of Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 22, 1980, Ser. No. 199,406
Int. Cl.³ F41G *3/26*
U.S. Cl. 434—22 **21 Claims**



1. A marksmanship training device comprising, in combination:

an imitation weapon having a barrel, and a trigger mechanism for effecting the simulated firing thereof, said trigger mechanism having an input and an output;

timing circuit means having an output connected to the input of the trigger mechanism of said weapon for generating a fundamental clock signal, said fundamental clock signal having a predetermined frequency;

emitter means mounted within the barrel of said weapon, and having an input and an output for broadcasting along a predetermined optical path, in response to said fundamental clock signal, a collimated square wave beam of laser light, said collimated square wave beam of laser light having a frequency the same as the frequency of said fundamental clock signal;

switching circuit means having a first input connected to the output of said trigger mechanism, a second input connected to the output of said emitter means, and an output connected to the input of said emitter means for activating said emitter means such that said emitter means will broadcast therefrom said collimated square wave beam of laser light whenever a marksman triggers the trigger mechanism of said weapon;

sensing means spatially disposed downstream from said emitter means, mounted upon a target, and having an output adapted for detecting the collimated square wave beam of laser light broadcast along said predetermined optical path, and for producing a square wave signal at the output thereof whenever the square wave beam of laser light broadcast along said predetermined optical path is detected thereby, said square wave signal having a frequency that is identical to that of said fundamental clock signal; and

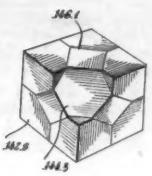
phase lock loop circuit means having an input connected to the output of said sensing means and an output for providing, in response to the square wave signal produced by said sensing means, a hit indicator signal.

4,317,653

EDUCATIONAL BLOCKS

Martha S. Wahl, 1 Huckleberry La., Ridgefield, Conn. 06877

Division of Ser. No. 896,175, Apr. 14, 1978, abandoned. This application Jan. 21, 1980, Ser. No. 113,462
Int. Cl.³ A63H *33/04*
U.S. Cl. 434—211 **2 Claims**



1. A set of educational blocks formed from a common cube and comprising

an orthotetrakaidecahedron being the largest which can fit inside said common cube and eight related outer segments which fit in complementary fashion with the orthotetrakaidecahedron to fill out a common cube, said related segments being combinable to form a congruent orthotetrakaidecahedron.

4,317,654

EDUCATIONAL BLOCKS

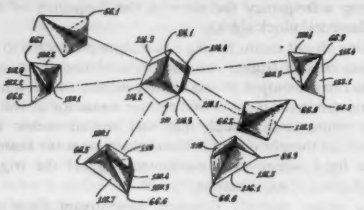
Martha S. Wahl, 1 Huckleberry La., Ridgefield, Conn. 06877

Division of Ser. No. 896,175, Apr. 14, 1978, abandoned. This application Jan. 21, 1980, Ser. No. 114,068
Int. Cl.³ A63H *33/04*
U.S. Cl. 434—211 **3 Claims**

1. A set of educational blocks formed from a common cube and comprising

a regular rhombic dodecahedron being the largest which can fit inside said common cube and twelve related outer

segments which fit in complementary fashion with the rhombic dodecahedron to fill out a common cube, said



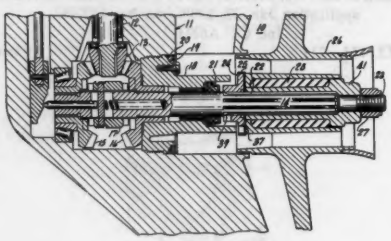
related out segments being selectively combinable to form three congruent rhombic dodecahedra.

4,317,655

MARINE DRIVE GEAR HOUSING

James M. Schiek, Omro, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Nov. 15, 1979, Ser. No. 94,739
Int. Cl.³ B63H *1/14, 1/28*
U.S. Cl. 440—78 **10 Claims**



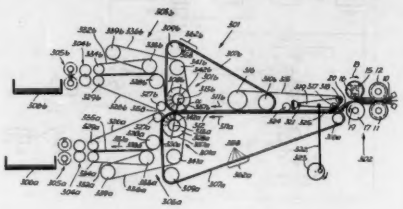
1. A marine drive including
(A) a gear housing having a propeller shaft,
(B) gear means positioned on said shaft for rotation thereof,
(C) a closure member positioned on said shaft and threadably engaged with said gear housing, and
(D) a propeller fixed on said propeller shaft for rotation thereby,
wherein the improvement comprises:
an intermediate member positioned on said propeller shaft between said propeller and said closure member, said intermediate member and said closure member each having mating engagement means, said intermediate member having a first position in which said mating engagement means are spaced and do not engage and a second position in which said mating engagement means are engaged so that rotation of said intermediate member rotates said closure member for removal.

4,317,656

ARTICLE-DEFLECTING SWITCHING MEANS FOR A SYSTEM OF ARTICLE CONVEYORS

Ehrhart Schulze, Fellbach, and Michael Berg, Remseck, both of Fed. Rep. of Germany, assignors to Karl Heinz Stiegler, Stuttgart, Fed. Rep. of Germany

Filed Feb. 1, 1980, Ser. No. 117,771
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1979, 2906164; Oct. 9, 1979, 2940924
Int. Cl.³ B31B *1/94, 23/02*
U.S. Cl. 493—197 **28 Claims**



1. A conveyor device for conveying a continuous succession of sheetlike workpieces each having two sides and a leading edge, said device comprising first and second conveyor means for successively conveying said workpieces, each of said first and second conveyor means having an entrance and an exit and at least two engagement surfaces for engaging the respective sides of said workpieces, said second conveyor means comprising first and second conveyors for conveying workpieces along different paths from their respective entrances, switching means located at the exit of said first conveyor means and at the respective entrances of said second conveyor means for directing said workpieces supplied from the exit of said first conveyor means alternatively to the respective entrances of one and the other conveyor of said second conveyor means, said switching means comprising at least two deflection means, each having an endless circumferential surface and being movably mounted for moving said circumferential surface along an endless path, one of the two endless paths having at least a portion which leads from the exit of said first conveyor means to the entrance of one conveyor of said second conveyor means, the other of the two endless paths having at least a portion which leads from the exit of said first conveyor means to the entrance of the other conveyor of said second conveyor means, drive means for driving said deflection means so that the circumferential surface of one of said deflection means moves in a direction of rotation opposite to that of the circumferential surface of said other deflection means, at least a portion of each of said circumferential surfaces being permeable to air, means for producing a vacuum in said permeable portions, means for controlling the vacuum in said permeable portions so that a vacuum is produced in the permeable portion of one circumferential surface in alternation with the permeable portion of the other circumferential surface, said controlling means being operative to establish a vacuum condition at the permeable portion of one circumferential surface when contacting the leading edge of alternate workpieces supplied from said first conveyor means, and said controlling means being further operative to establish a vacuum condition at the permeable portion of the other circumferential surface when contacting the leading edge of remaining workpieces supplied from said first conveyor means, whereby leading edges of successive workpieces adhere in alternation to said permeable portions and are conveyed in alternation to the respective conveyor entrances of said second conveyor means.

4,317,657

GASOLINE ADDITIVE FLUIDS TO REDUCE HYDROCARBON EMISSIONS

Leonard M. Niebylski, Birmingham, Mich., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 890,494, Mar. 27, 1978, Pat. No. 4,175,927. This application May 31, 1979, Ser. No. 44,151
The portion of the term of this patent subsequent to Nov. 27, 1996, has been disclaimed.
Int. Cl.[3] C10L *1/18*
U.S. Cl. 44—66 7 Claims

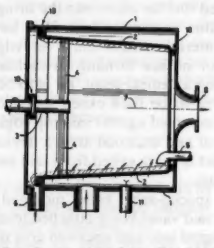
1. As a composition of matter, an additive fluid for low lead or essentially lead-free gasoline comprising an organo-manganese compound and an exhaust emission reducing amount of a compound selected from a dimer acid, a trimer acid, or a mixture of a dimer and trimer acid produced by the polymerization or condensation of an unsaturated aliphatic monocarboxylic acid having between 16 and 18 carbon atoms per molecule.

4,317,658

APPARATUS FOR THE GASIFICATION OF FUEL

Rudolf Hendriks, Velp; Aloysius J. W. Oude Alink, Zevenaar, and Berend P. Van Marle, Dieren, all of Netherlands, assignors to Thomassen Holland B.V., Rheden-De Steeg, Netherlands

Filed Aug. 5, 1980, Ser. No. 175,434
Claims priority, application Netherlands, Aug. 20, 1979, 7906303
Int. Cl.[3] C10J *3/42, 3/48*
U.S. Cl. 48—61 6 Claims



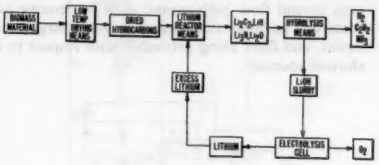
1. Apparatus for the preparation of a combustible gas mixture from solid or liquid fuels, such as coal or heavy oils, comprising a stationary treatment housing including therein a substantially conically shaped perforated grate rotatably mounted about a substantilly horizontal axis, provided with means defining an inlet for fuel toward one side of said grate and means defining an inlet for a gasification fluid along the entire other side of said grate, wherein the grate consists of at least one basekt shaped grate with two substantially axially positioned open ends on the opposite sides and the fuel inlet means is located near the open end of the grate having the smallest diameter to dispose fuel on the grate, means defining an ash outlet being accomodated at the end of the basket having the widest diameter to dispose ashes from said grate, means defining an outlet for the combustible gas mixture being arranged at the small end near the axis of the grate, whilst during operation rotation of the grate is maintained, and drive means for rotating the basket at a speed such that the fuel is pressed against the supporting grate.

4,317,659

PRODUCTION OF HYDROGEN, ACETYLENE AND AMMONIA GASES FROM LITHIUM REACTION WITH HYDROCARBON MATERIALS

Michael G. Down, Plum Borough, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 24, 1980, Ser. No. 114,879
Int. Cl.[3] C10J *3/00*
U.S. Cl. 48—209 10 Claims



1. A method of producing a gaseous mixture comprising H_2 and C_2H_2, comprising the steps of:

(A) providing a non-carbonized hydrocarbon biomass waste material, and then

(B) drying the hydrocarbon biomass waste material at a temperature of up to about 65° C. for a time effective to remove substantially all water, without carbonization, to provide a dried non-carbonized hydrocarbon biomass waste material containing major amounts of H and C atoms, where no substantial amount of hydrogen, oxygen or nitrogen gas is driven off from the hydrocarbon biomass material, and then

(C) reacting the dried, non-carbonized hydrocarbon containing biomass waste material with a stoichiometric excess of molten lithium metal, at a temperature over about 300° C. in the absence of air and moisture, to produce a product mixture comprising lithium salts: LiH and Li_2C_2, and then

(D) hydrolyzing the lithium salts to produce a gaseous product mixture comprising H_2 and C_2H_2.

4,317,660

MANUFACTURING OF FLEXIBLE ABRASIVES

Jost Kramis, Islikon, and Jakob Ackermann, Wigoltingen, both of Switzerland, assignors to SIA Schweizer Schmirgel-und Schleif-Industrie AG, Frauenfeld, Switzerland

Filed Apr. 28, 1980, Ser. No. 144,593
Claims priority, application Fed. Rep. of Germany, May 4, 1979, 2918103
Int. Cl.[3] B24D *11/00*
U.S. Cl. 51—295 11 Claims

1. A method of manufacturing a flexible abrasive, comprising the steps of applying a pattern of a base binding agent to a flexible support by means of a stencil, and binding abrasive grains to the support by means of the base binding agent, the stencil having a wall thickness of 0.08 to 1 mm and having holes with a diameter of 0.05 to 3 mm, the total area of the holes amounting to 5 to 50% of the area of the stencil.

4,317,661

ELECTRONIC AIR CLEANER

Ryosuke Sasaoka; Yasuo Ishino, and Kaoru Maekawa, all of Yokaichi, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation of Ser. No. 885,075, Mar. 9, 1978, abandoned. This application Aug. 17, 1979, Ser. No. 67,916
Claims priority, application Japan, Mar. 16, 1977, 52-29444; Apr. 15, 1977, 52-43928; May 9, 1977, 52-53419; Jun. 28, 1977, 52-77674; Jul. 12, 1977, 52-83857
Int. Cl.[3] B03C *3/12, 3/41*
U.S. Cl. 55—131 10 Claims

1. An electronic gas cleaner comprising:

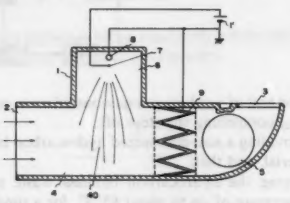
means defining a gas flow path having an intake for intaking

dirty, dust-laden gas, an outlet for discharging electronically cleaned gas and a gas flow path therebetween,

a gas transport means for causing said gas to flow from said intake to said outlet of said flow path means,

an ion shower source including an ion generating electrode and a grounded counterelectrode both connected to a high voltage source for generating an ion shower and directing same to a reacting area within said flow path means for reaction with said dust,

a filter installed adjacent to but downstream of said reacting area in said flow path means so as to remove said dust from said gas such that clean gas is discharged from said outlet, said filter being grounded with respect to said ion shower source,



said ion generating electrode including at least one fine metal wire, said ion shower source being installed in a chamber disposed outside of and opening into said reacting area, said ion generating electrode being disposed closer to said reacting area than said counterelectrode, and

said high voltage source being sufficient to generate a corona discharge between said ion generating and counter electrodes and said filter to generate an electric field having electric force lines therein which diverge from said ion generating electrode into said reacting area to drive generated ions along said electric force lines, thereby electrically charging said dust contained in said gas by reaction between said ion shower and said dust.

4,317,662

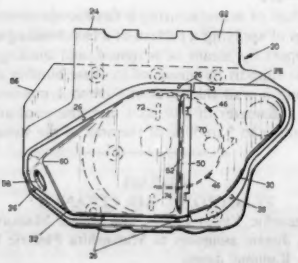
OIL SEPARATOR DEVICE

Sharon J. Hudson, Jr., Toledo, Ohio, assignor to Sharon Manufacturing Company, Toledo, Ohio

Continuation-in-part of Ser. No. 19,886, Mar. 12, 1979, Pat. No. 4,234,328. This application Oct. 17, 1980, Ser. No. 197,900

Int. Cl.³ B01D *45/12*

U.S. Cl. 55—392 **14 Claims**



1. A device for separating oil from oil laden fumes in the crankcase ventilation system of an internal combustion engine, said device comprising an elongated sheet metal cannister with two opposite ends, a top wall, a peripheral wall, partition means and a U-shaped baffle positioned in the cannister and with respect to each other to in said cannister define a fume outlet chamber, a fume inlet chamber and an oblong separating chamber; an inlet opening in said cannister adjacent to one of said opposite ends and in flow communication with said inlet chamber for supplying oil laden fumes to said separating chamber; an outlet opening in said cannister adjacent to the other of said opposite ends and in flow communication with said fume outlet chamber for exhausting fumes from said fume outlet chamber, said baffle having its closed end adjacent to the inlet opening end of said cannister, one of the legs of said baffle being attached to a peripheral wall section of said cannister and the other leg spaced from an opposite peripheral wall section such that incoming oil laden fume is directed through said space into a first 180° volute section formed by an arcuate wall section of said oil separating chamber adjacent to the open end of said baffle and then into a second 180° volute section formed by the inside of the closed end of said baffle, said first volute section having a greater radius than said second volute section to thereby produce a vortex region adjacent to the center of said second volute section; a flue aperture in said partition means between said separating chamber and said fume outlet chamber above said vortex region in said separating chamber and an oil return hole in the bottom of said cannister.

4,317,663

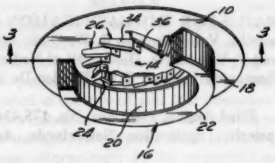
AIR FILTER INCLUDING A VORTEX DEVICE

Delmar L. Dollar, 1422 E. Rosecrans, Compton, Calif. 90221

Filed Jul. 18, 1980, Ser. No. 170,139

Int. Cl.³ B01D *46/42;* **F02M** *7/00*

U.S. Cl. 55—413 **4 Claims**



1. In combination with an air filter adapted to be positioned to remove foreign particles from air prior to intermixing of the air with vaporized fuel for entry into the firing chambers of an internal combustion engine, said air filter having an exterior surface and an interior surface and a top edge and a bottom edge, said interior surface forming an enclosed area, said enclosed area having a central point, air is to be conducted into said enclosed area to be then exited therefrom through said bottom, a cover mounted against said top edge of said air filter closing said top of said enclosed area, a device for generating a vortex of air that is being exited from said enclosed area, said device comprising:

a plurality of spaced-apart vanes mounted within said enclosed area, said vanes being attached to said cover, the air being conducted into said enclosed area is caused to move past said vanes to be formed into a plurality of separate airstreams, said separate airstreams are then directed tangentially in respect to said central point thereby producing a vortex;

each said vane being constructed of sheet material having an elongated section and a shortened section and each of said sections having a frontal surface and a rear surface, the said frontal surface of one said vane cooperating with the said rear surface of a directly adjacent said vane to produce a path for air forming a said airstream, said frontal surface of said elongated section being planar, said frontal surface of said shortened section being planar, said frontal surface of said shortened section being inclined forming a first angle with respect to said frontal surface of said elongated section, said shortened section being located downstream of said elongated section with respect to the path of air flow, said shortened section having an outer free edge located within said enclosed area; and

the height of said elongated section at the connection to said shortened section being substantially greater than the

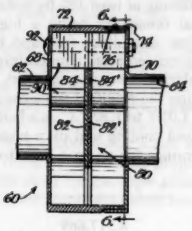
height on the opposite end of said elongated section, said frontal surface of said elongated section being inclined at a second angle in respect to a line connecting said central point and said opposite end of said elongated section, said first angle being approximately one hundred and thirty degrees with said second angle being approximately forty degrees.

4,317,664

VACUUM CLEANER ATTACHMENT

Victor L. Ciummo, 503 Millers Rd., Des Plaines, Ill. 60016

Filed Sep. 22, 1980, Ser. No. 189,718
Int. Cl.³ B01D *45/00*
U.S. Cl. 55—434 **1 Claim**



1. A vacuum cleaner attachment comprising an elongated tubular member including an enlarged cylindrical intermediate portion, tube sections extending from said enlarged intermediate portion, said tube sections being concentric, said enlarged portion having axially spaced walls, said walls extending substantially normally to the axis of said enlarged portion and said walls extending beyond the interior peripheries of said tube sections, plate means interposed between the walls and being spaced from each wall, said plate means having spaced openings around its outer perimeter, with the openings being located radially outwardly of the peripheries of the tube sections to define non-axial flow passages through said attachment, tabs extending from said plate means in opposite directions, the free ends of said tabs respectively engaging the walls adjacent thereto to hold the plate means between said walls, and said tabs and said non-axial flow passages providing obstructions for elongated and relatively large articles to prevent passage thereof through said attachment.

4,317,665

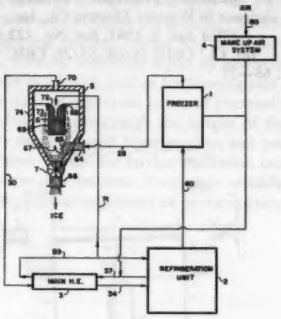
CRYOGENIC FREEZING SYSTEM

Alan L. Prentice, Surbiton, England, assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Dec. 22, 1980, Ser. No. 219,158
Int. Cl.³ F25D *13/06*
U.S. Cl. 62—63 **9 Claims**

1. In an apparatus for freezing articles comprising in combination a freezer having an inlet for admitting the articles to be frozen, an outlet for permitting the frozen articles to leave said freezer and a conveyor for transporting the articles through said freezer from said inlet to said outlet thereof; a refrigerant supply main connected to said freezer for introducing refrigerant air to said freezer; a return main connected to said freezer for receiving the warmed air from said freezer; refrigeration means connected to said refrigerant supply main for supplying said supply main with air a cryogenic temperatures; and a main heat exchanger having a high pressure side connected to said refrigeration means and a low pressure side connected between said refrigeration means and said return main for exchanging the refrigerant value of said warmed air from said return main in said low pressure side with the air from said refrigeration means in said high pressure side; the improvement which comprises;

bag filter means connected between said return main and said main exchanger for removing ice particles from the warmed air in said return main prior to exchanging its



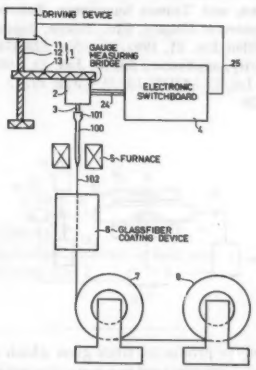
refrigeration value in said main heat exchanger, which filter means comprises at least one bag which is periodically pulsed to remove ice collected therein.

4,317,666

PROCESS AND APPARATUS FOR CONTROLLING THE DRAWING OF AN OPTICAL FIBRE FROM A GLASS PREFORM

Michel Faure, and Yves Lumineau, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Sep. 3, 1980, Ser. No. 183,649
Claims priority, application France, Sep. 6, 1979, 79 22299
Int. Cl.³ C03B *37/025, 37/07*
U.S. Cl. 65—2 **3 Claims**



1. A process for controlling the drawing of an optical fibre from a glass preform or gathering mould introduced into a fibre formation furnace, comprising the steps of:

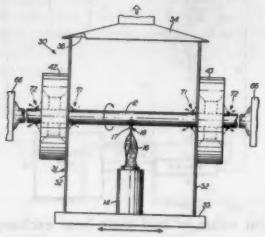
regulating the heating and consequently the temperature of the preform at the fiber formation point by maintaining constant the tensile stress of the glass fibre at said fibre formation point, the tensile stress being measured at the point of suspension of the preform; and,

compensating the effect on the result of the measurement of the reduction in the preform weight at the point where the preform is lowered.

4,317,667
METHOD AND APPARATUS FOR FABRICATING LIGHTGUIDE PREFORMS

Carroll D. Spainhour, Princeton Township, Mercer County, N.J., assignor to Western Electric Co., Inc., New York, N.Y.

Filed Jan. 5, 1981, Ser. No. 222,427
Int. Cl.³ C03B *19/06, 35/26;* C03C *17/00*
U.S. Cl. 65—27 14 Claims



1. A method for preventing contaminants from escaping through an opening in a chamber as an elongated article passes through and in spaced relation to the periphery of the opening, the method comprising the step of:

directing a first, laminar flow, gas shield from a first slit circumferential of the opening, into the chamber, towards a point along the axis of the article passing therethrough.

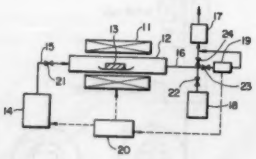
8. A method of preventing gaseous contaminants, containing particulate matter therein, from passing through an opening in a chamber, the method comprising the step of:

directing a first laminar flow, gas shield through a first slit circumferential of the opening in such a manner that the slit forms the base of the gas shield having an apex within the chamber.

4,317,668
METHOD FOR PRODUCING SILICA GLASS

Kenzo Susa, Hinodemachi; Iwao Matsuyama, Sagamihara; Shin Satoh, Iruma, and Tsuneo Suganuma, Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 21, 1981, Ser. No. 226,876
Claims priority, application Japan, Jan. 21, 1980, 55-4600
Int. Cl.³ C03B *19/06;* C01B *33/12*
U.S. Cl. 65—29 16 Claims



1. A method for producing silica glass which comprises

(i) subjecting a dry silica gel to a water desorption treatment,

(ii) heating the resultant silica gel to effect a carbon removal treatment,

(iii) increasing the temperature in a chlorine-containing atmosphere to effect a hydroxyl group removal treatment,

(iv) further heating the resultant silica gel to a temperature of about 1,000° to 1,100° C. in an atmosphere other than air, containing at least 1% by volume of oxygen and the substantial remainder being a high purity inert or neutral gas that is moisture free to effect a chlorine removal treatment, and

(v) further heating the resultant silica gel to a temperature of about 1,050° to 1,300° C. in a helium atmosphere or in a vacuum to effect a sintering treatment.

2. A method for producing silica glass which comprises

(i) heating a silica material made of dry silica gel by raising the temperature to about 250° C. to effect a water desorption treatment,

(ii) further heating the resultant silica material by raising the temperature to about 700° C. in an oxidizing atmosphere to effect a carbon removal treatment,

(iii) further heating the resultant silica material by raising the temperature from about 700° C. to about 1,000° C. to 1,050° C. in an atmosphere containing at least 1% by volume of chlorine to effect a hydroxyl group removal treatment,

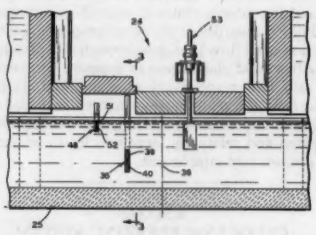
(iv) further heating the resultant silica material to a temperature of about 1,000° to 1,100° C. in an atmosphere other than air, containing at least 1% by volume of oxygen and the substantial remainder being a high purity inert or neutral gas that is moisure free and holding said silica material at a predetermined temperature for up to 2 hours to effect a chlorine removal treatment, and

(v) further heating the resultant silica material to a temperature of about 1,050° to 1,300° C. in a helium atmosphere or in a vacuum and holding said silica material at a predetermined temperature for up to 1 hour to effect a sintering treatment.

4,317,669
GLASS MELTING FURNACE HAVING A SUBMERGED WEIR

Gerald R. Boss, Peru, Ill., and Alejandro G. Bueno, Toledo, Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Aug. 18, 1980, Ser. No. 179,096
Int. Cl.³ C03B *5/16*
U.S. Cl. 65—135 12 Claims



1. In a method of processing a bath of molten glass in a tank type melting furnace of substantially uniform depth throughout its length and having melting and working zones separated by a waist section of reduced width, including charging glass batch materials to one end of a melting tank, heating the batch materials in the melting zone of the tank for reducing them to a molten state and setting up convection currents therein, and passing the molten glass through the waist section to the working zone, said convection currents including a forward surface flow and return bottom flow of molten glass within said waist section, the improvement comprising impeding but not eliminating the return bottom flow of the molten glass passing through the waist section from the working zone to the melting zone.

5. In a tank type glass melting furnace including melting and working sections interconnected by a waist section of lesser width than said melting and working sections, and a bath of molten glass of substantially uniform depth throughout its length within said tank, wherein molten glass flows from said melting section to said working section through said waist section and includes convection currents providing a forward surface flow and return bottom flow of molten glass within

said waist section, the improvement comprising a submerged weir extending horizontally across at least part of the width of the waist section and adjacent the bottom thereof, said weir being located within the normal path of the return flow of molten glass toward the melting section, whereby said return flow is impeded but not eliminated.

4,317,670

MICROBIOLOGICAL PROCESS FOR RECULTIVATION OF INDUSTRIAL REFUSE HEAPS

Anatoly N. Khoroshavin, ulitsa gazety "Zvezda", 14, kv. 17; Irina V. Kataeva, bulvar Gagarina, 87, kv. 75; Gennady A. Oborin, ulitsa Tsentralnaya, 31, kv. 69, and Alexandr P. Krasavin, ulitsa Poliny Osipenko, 56, kv. 57, all of Perm, U.S.S.R.

Filed Jan. 4, 1980, Ser. No. 109,533
Int. Cl.³ C05F *11/08*
U.S. Cl. 71—6 7 Claims

1. A microbiological process for recultivation of industrial refuse heaps consisting in the following steps performed in the succession specified hereinbelow:

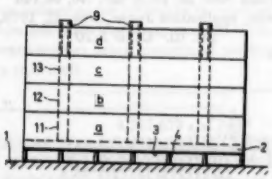
(a) smoothing out the industrial refuse heaps;
(b) introduction thereinto of a fertilizer resulting from purification of production-communal waste waters;
(c) introduction thereinto of a humic preparation containing a culture of the mold fungus *Aspergillus niger* producing humus and isolated from said refuse heaps;
(d) plowing;
(e) sowing seeds of perennial plants;
(f) inoculation of the sown surface of refuse heaps with a bacterial preparation containing a culture of ammonifying and nitrifying bacteria recovered from said refuse heaps;
(g) inoculation of the heap surface with a bacterial preparation containing a culture of azotobacter and phosphate-dissolving bacteria recovered from said refuse heaps during the period of plant sprouting and tillering;
(h) watering of the plants.

4,317,671

PROCESS OF COMPOSTING REFUSE OR REFUSE/SEWAGE SLUDGE MIXTURES BY THERMAL RETTING

Hannes Willisch, Pulheim, Fed. Rep. of Germany, assignor to von Roll AG, Gerlafingen/Schweiz, Fed. Rep. of Germany

Filed Feb. 28, 1980, Ser. No. 125,684
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1979, 2909515; Jan. 17, 1980, 3001508
Int. Cl.³ C05F *7/00, 9/04*
U.S. Cl. 71—9 23 Claims



1. A process of composting by thermal retting comprising the steps of piling refuse to form a first layer of a predetermined generally uniform height, maintaining an area below the first layer which is accessible to atmosphere, forming generally vertical flue-like vents in the first layer extending between the area below the first layer and an upper surface of the first layer, maintaining the first layer under conditions sufficient for thermally retting the material of the first layer for a predetermined period of time until the material has generally solidified and become self-supporting through retting and entanglement of the retted refuse, thereafter forming a second layer of a predetermined generally uniform height atop the first layer, forming generally vertical flue-like vents in the second layer in fluid communication with the flue-like vents of the first layer, maintaining the second layer under conditions sufficient for thermally retting the material of the second layer for a predetermined period of time until the same has generally solidified and become self-supporting through retting and entanglement of the retted refuse, forming additional layers by performing the steps and under the conditions recited for forming said second layer such that a stack of numerous layers of eventually completely retted refuse is formed with the height of the stack corresponding to the combined layer heights, and removing the stack or portions thereof for further utilization only after the uppermost layer has become completely solidified and self-supporting through entanglement of its completely retted refuse.

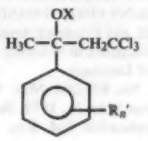
4,317,672

METHOD AND PRODUCT FOR TREATING SOIL TO SUPPRESS THE NITRIFICATION OF AMMONIUM NITROGEN THEREIN

Jeffrey D. Griffith, Lafayette, Calif., and Thomas M. Ozretich, Vancouver, Wash., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 19, 1979, Ser. No. 59,086
Int. Cl.³ C05G *3/08*
U.S. Cl. 71—27 18 Claims

1. A fertilizer composition useful for suppressing the nitrification of ammonium nitrogen in growth media and for preventing rapid loss of ammonium nitrogen therefrom comprising a reduced nitrogen fertilizer and from 0.05 to 95 percent by weight of the reduced nitrogen in the fertilizer of a compound having the formula



wherein
X is H or

R is H or C_1-C_8 alkyl;
R' is C_1-C_4 alkyl, C_1-C_4 alkoxy or halo and
n is an integer from 0 to 2.

4,317,673

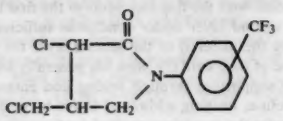
SYNERGISTIC HERBICIDAL COMPOSITIONS

Gerald H. Thiele, Sunnyvale, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 69,471, Aug. 24, 1979, abandoned. This application Apr. 8, 1980, Ser. No. 138,386
Int. Cl.³ A01N *43/36, 47/30*
U.S. Cl. 71—95 6 Claims

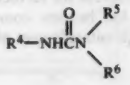
1. A synergistic herbicidal composition consisting essentially of a mixture of

(a) an effective amount of a pyrrolidone of the formula



and

(b) an effective amount of a urea of the formula



in which

R^4 is p-chlorophenoxyphenyl;

R^5 is C_1–C_4 alkyl; and

R^6 is C_1–C_4 alkyl;

at a weight ratio of (a) to (b) of from about 0.5:1 to about 10:1.

4,317,674

DIURETHANES, PROCESS FOR MAKING THE SAME AND SELECTIVE HERBICIDE COMPOSITION CONTAINING SAME

Gerhard Boroschewski, and Friedrich Arndt, both of Berlin, Fed. Rep. of Germany, assignors to Schering AG, Berlin and Bergkamen, Fed. Rep. of Germany

Continuation of Ser. No. 848,094, Mar. 11, 1977, abandoned. This application May 24, 1979, Ser. No. 42,062

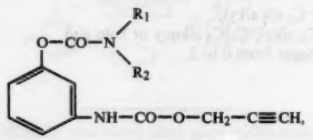
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1976, 2650796

The portion of the term of this patent subsequent to May 13, 1997, has been disclaimed.

Int. Cl.[3] **A01N** *37/44; C07C 125/075*

U.S. Cl. 71—111 **25 Claims**

1. A selectively herbicidal compound particularly with soybeans of the formula



wherein

R_1 is C_1–C_4 alkyl, C_1–C_4 alkenyl, chloro- C_1–C_4 alkyl or bromo- C_1–C_4 alkyl; and

R_2 is phenyl or phenyl substituted in one or several places by one or more substituents selected from the group consisting of C_1–C_3 alkyl, C_1–C_3 alkoxy, trifluoromethyl, fluoro and chloro.

24. A herbicidal composition comprising at least one active agent as defined in claim **1** in an amount between 10 and 80% by weight and about 90 to 20% by weight of liquid or solid carrier materials.

4,317,675

MAGNETIC IRON POWDER CONTAINING MOLYBDENUM

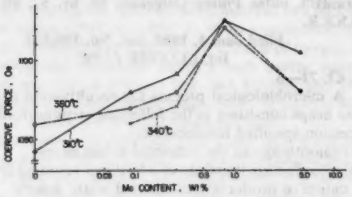
Toshikazu Nishihara; Hiromasa Isono; Tunehide Naruse; Sadao Ozaki, and Noboru Takahashi, all of Yokohama, Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

Division of Ser. No. 948,566, Oct. 4, 1978, abandoned. This application Dec. 4, 1979, Ser. No. 100,991

Claims priority, application Japan, Oct. 6, 1977, 52/120422

Int. Cl.[3] **C22C** *1/04*

U.S. Cl. 75—0.5 BA **12 Claims**



1. A method of producing a magnetic metallic powder useful in magnetic recording media having superior magnetic properties and characterized in having an improved coercive force and improved saturation magnetization, said metallic powder comprising iron as a principal component, the method comprising the steps of:

(a) treating a fine powder of an iron oxide which is acicular in particle shape with an alkaline aqueous solution of a molybdenum compound whereby said fine powder adsorbs molybdenum in the form of ions;

(b) drying the treated powder; and

(c) heating the dried powder in a stream of a reducing gas at a temperature in the range from about 250° C. to about 480° C. to accomplish reduction of said iron oxide;

wherein step (a) is performed such that said magnetic metallic powder comprises molybdenum in an amount of 0.05 to 5% by weight of iron in said magnetic metallic powder.

4,317,676

PROCESS FOR PRODUCING SINTERED IRON ORE HAVING HIGH REDUCIBILITY

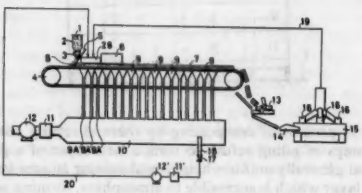
Hideaki Souma; Norimitsu Konno; Yohzoh Hosotani, and Jyuzo Shibata, all of Muroran, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Nov. 20, 1979, Ser. No. 96,146

Claims priority, application Japan, Nov. 22, 1978, 53-144587

Int. Cl.[3] **C22B** *1/20*

U.S. Cl. 75—5 **2 Claims**



1. A process for producing sintered ore with high reducibility by sintering a raw material mix of a moisture content between 5 and 7% pallets of a sintering machine, which comprises drying the surface layer of said mix on the pallets so that it is dried by a thickness equal to 8 to 31% of the thickness of the mix bed, and thereafter igniting the surface layer of the mix to sinter the same with air or gas sucked downward.

4,317,677

PROCESS FOR PRODUCING LIQUID CRUDE IRON AND REDUCTION GAS

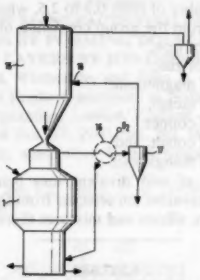
Ralph Weber, Sao Paulo, Brazil; Emil Elsner, Baden-Baden, Fed. Rep. of Germany; Walter Maschlanka, Gaggenau, Fed. Rep. of Germany; Bernt Rollinger, Baden-Baden, Fed. Rep. of Germany, and Gerhard Sanders, Baden-Baden, Fed. Rep. of Germany, assignors to Korf-Stahl AG., Baden-Baden, Fed. Rep. of Germany

Filed Oct. 3, 1979, Ser. No. 81,490

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1978, 2843303

Int. Cl.³ C21B *11/00*

U.S. Cl. 75—43 25 Claims



1. A process for the production of molten crude iron and reduction gas in a smelting gasifier producing a melt of iron at the bottom thereof which comprises the steps of introducing hot sponge iron of a particle size of between about 3 mm and 30 mm at a temperature of from about 500° to 950° C., into the upper portion of the gasifier, further introducing into the upper portion of the gasifier coal to form a fluidized bed of coal particles having a depth of at least 1.5 m, still further introducing into a lower portion of said gasifier an oxygen-containing gas, adjusting the ratio of the oxygen-containing gas and coal fed to the gasifier to establish and maintain said coal in a fluidized state and to maintain a high temperature zone in the lower portion of said gasifier at about from 2000° to 2500° C., and reducing the temperature of said fluidized bed of coal at substantially the upper region thereof to a temperature of from about 1000° to 1400° C., retarding and heating said sponge iron particles introduced into the upper portion of the gasifier as they fall through the fluidized bed and smelting said particles in the high temperature zone to form a melt, tapping the melt of crude iron formed at the bottom of the gasifier and taking off the reduction gas from the upper portion of the gasifier, said oxygen-containing gas being introduced substantially immediately above said melt.

4,317,678

PROCESS FOR CONTINUOUS CASTING OF ALUMINUM-DEOXIDIZED STEEL

Gloria M. Faulring, Niagara Falls, and Donald C. Hilty, Sanborn, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Sep. 26, 1980, Ser. No. 191,250

Int. Cl.³ C21C *7/02*

U.S. Cl. 75—58 7 Claims

1. An improved process for continuous casting of an aluminum-deoxidized steel which comprises: adding to the molten steel an amount of calcium or calcium-bearing material which is sufficient to establish a calcium concentration exceeding the aluminum content by a value greater than about 0.14 and then directing the molten steel through a nozzle and continously casting the molten steel into the desired shape.

4,317,679

METHOD AND APPARATUS FOR THE DEGASSING OF MOLTEN METAL

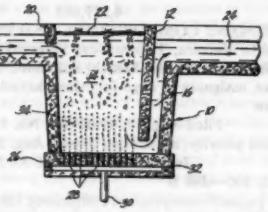
Jonathan A. Dantzig, New Haven, and Derek E. Tyler, Cheshire, both of Conn., assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Continuation of Ser. No. 41,787, May 23, 1979, Pat. No. 4,235,627, which is a continuation-in-part of Ser. No. 865,895, Dec. 30, 1977, abandoned. This application Apr. 14, 1980, Ser. No. 139,782

The portion of the term of this patent subsequent to Nov. 25, 1997, has been disclaimed.

Int. Cl.³ C21C *7/00*

U.S. Cl. 75—93 E 3 Claims



1. An apparatus for degassing molten metal by purging said molten metal with a fluxing gas which comprises a fluxing box having a floor, inlet means for delivering said molten metal to said fluxing box, outlet means for removing said molten metal from said fluxing box, the improvement which comprises means located within said fluxing box for purging said molten metal with said fluxing gas while said molten metal is within said fluxing box, said means comprising a sparger plate means being provided with an array of orifices of controlled size and spacing wherein said orifice size is in the range of 0.005" to 0.050" and said orifice spacing is in the range of 0.25" to 5.00" so as to minimize fluxing gas bubble size while maximizing fluxing gas bubble dispersion thereby optimizing the degassing of said molten metal.

4,317,680

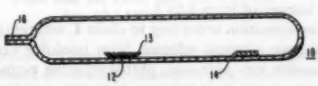
DIFFUSION SOURCE AND METHOD OF PREPARING

Chang K. Chu, Export, and George W. Vomish, Ruffsdale, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 31, 1980, Ser. No. 202,552

Int. Cl.³ C22C *28/00*

U.S. Cl. 75—134 S 10 Claims



1. A diffusion source for introducing doping impurities into a body of semiconductor material, said source consisting of a quantity of pure silicon powder and a quantity of at least one p-type doping agent selected from the group consisting of gallium, boron and aluminum diffused into said silicon powder.

4,317,681

MODIFIERS FOR ION-LEACHABLE CEMENT COMPOSITIONS

Charles H. Beede, East Brunswick, and Richard N. Zirnite, Somerset, both of N.J., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Nov. 7, 1980, Ser. No. 204,982
Int. Cl.³ C09K 3/00
U.S. Cl. 106—85 13 Claims

1. In a dry cementitious composition comprising ion-leachable glass powder, the improvement wherein said composition further comprises d,l-tartaric acid.

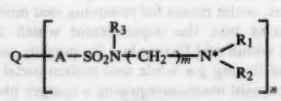
4,317,682

PIGMENT COMPOSITIONS AND USE THEREOF

Hiromitsu Katsura, Tokorozawa; Shigeyuki Ebashi, Kawagoe; Junichi Tsuchida, and Kenichi Kakimoto, both of Tokyo, all of Japan, assignors to Toyo Ink Manufacturing Co. Ltd., Tokyo, Japan

Filed Aug. 15, 1980, Ser. No. 178,293
Claims priority, application Japan, Aug. 27, 1979, 54-108120
Int. Cl.³ C04B 31/28, 31/38
U.S. Cl. 106—288 B 6 Claims

1. A pigment composition comprising 100 parts by weight of a pigment and from 0.3 to 30 parts by weight of a substantially colourless aromatic compound having the following general formula (I)



(I)

wherein Q is a residue of an aromatic polycyclic compound and A is a direct link between Q and —SO_2— or a member selected from the group consisting of —O—,

—S—, —CO—, —SO_2—,

a divalent phenylene residue and combinations thereof, in which R^4 and R^5 represent, independently, a hydrogen atom or an alkyl group containing from 1 to 4 carbon atoms, R_1 and R_2 represent, independently, a hydrogen atom or an alkyl group containing from 1 to 4 carbon atoms, or R_1 and R_2 together form a heterocyclic ring together with N^+ in the formula (I), R_3 represents a hydrogen atom or an alkyl group containing from 1 to 20 carbon atoms, m is an integer of from 1 to 6 and n is an integer of from 1 to 3.

3. A composition according to claim 1, wherein the pigment is an organic pigment selected from insoluble azo pigments, condensation azo pigments, phthalocyanine pigments, quinacridone pigments, isoindolenone pigments, perylene pigments, perynone pigments, dioxazine pigments, lake pigments, vat dye pigments and basic dye pigments.

4. A composition according to claim 1, wherein the pigment is an inorganic pigment selected from carbon black, titanium oxide, chrome yellow, cadmium yellow, cadmium red, red iron oxide, iron black, zinc flower, Prussian blue and ultramarine.

4,317,683

ORANGE PIGMENTS OF INVERSE SPINEL STRUCTURE PRODUCED BY CO-CALCINATION OF COMPOUNDS OF IRON AND ZINC WITH COMPOUNDS OF TITANIUM, TIN AND/OR SILICON

Richard A. Eppler, Timonium, Md., assignor to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Mar. 2, 1981, Ser. No. 239,783
Int. Cl.³ C09C 1/04, 1/22, 1/28, 1/36
U.S. Cl. 106—292 6 Claims

1. An inorganic orange pigment of an inverse spinel structure having the general formula:

$$X_2Y_nO_{2n+2}$$

wherein n is a number of from 0.3 to 2.5, wherein X is a divalent ion selected from the group consisting of

0.4 to 1.7 mols of iron,
0.3 to 1.6 mols of zinc,
0 to 0.6 mols of magnesium,
0 to 0.2 mols of nickel,
0 to 0.2 mols of copper,
0 to 0.2 mols of cobalt, and
0 to 0.2 mols of manganese,

the total amount of said divalent ions being 2 mols, and wherein Y is a tetravalent ion selected from the group consisting of titanium, tin, silicon and mixtures thereof.

4,317,684

PROCESS OF CONVERTING POLLUTING PARTICLES, EMITTED IN CHEMICAL OR PHYSICAL PROCESSES, INTO HARMLESS SUBSTANCES

Carel W. J. Hooykaas, Rotterdam, Netherlands, assignor to Pelt & Hooykaas B.V., Netherlands

Filed Nov. 13, 1979, Ser. No. 93,512
Claims priority, application Netherlands, Nov. 22, 1978, 7811498
Int. Cl.³ B28B 1/54; C04B 5/00; C08K 3/34; C09K 3/14
U.S. Cl. 106—316 12 Claims

1. A process of converting polluting metal or metal compound particles being emitted in chemical or physical processes into harmless substances, said polluting particles being caught and mixed with at least 10% of a molten silicate-containing slag.

10. A process according to claim 1, wherein anti-skid-promoting stabilizer is added to the melt obtained, and the melt as obtained is broken.

4,317,685

METHOD FOR REMOVING A SCALE FROM A SUPERALLOY SURFACE

Pritam L. Ahuja, West Chester, Ohio, and Marcus P. Borom, Schenectady, N.Y., assignors to General Electric Company, Cincinnati, Ohio

Filed Jun. 6, 1980, Ser. No. 157,610
Int. Cl.³ B08B 3/10
U.S. Cl. 134—2 2 Claims

1. A method of removing scale from a surface of an internal passage within an article of a high temperature superalloy based on at least one element from the group consisting of Co and Ni, the scale being selected from the group consisting of oxides, silicates, sulfides and their combinations and being the corrosion products resulting from the surface having been exposed to strenuous environmental conditions at high temperature, comprising the steps of:

providing an aqueous alkaline hydroxide solution comprising about 20–75 weight percent of a hydroxide selected from the group consisting of NaOH, KOH and their mixtures;

immersing the surface in the hydroxide solution within a sealed autoclave in the presence of a non-oxidizing atmosphere;

heating the hydroxide solution in the autoclave at a temperature in the range from about 200 to a maximum of 340 C. for a time sufficient to react the solution with the scale to form a scale reaction product while providing relative movement between the solution and the scale within the internal passage; and then

flushing the scale reaction product and the alkaline solution from the internal passage.

4,317,686

METHOD OF MANUFACTURING FIELD-EFFECT TRANSISTORS BY FORMING DOUBLE INSULATIVE BURIED LAYERS BY ION-IMPLANTATION

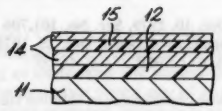
Kranti V. Anand, Whitstable, and John B. Butcher, Hertford Heath, both of England, assignors to National Research Development Corporation, London, England

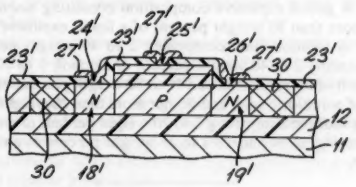
Filed Jun. 27, 1980, Ser. No. 163,478

Claims priority, application United Kingdom, Jul. 4, 1979, 23235/79

Int. Cl.³ H01L *7/54, 21/265*

U.S. Cl. 148—1.5 **7 Claims**





1. A method for constructing a field-effect transistor comprising the steps of:

(a) implanting ions in a body of crystalline semiconductor material to form a first relatively high ion-concentration layer buried in the semiconductor material adjacent to a surface of the body, the ions being of a type which is at least capable of making the first layer an insulating layer;

(b) forming a layer of crystalline semiconductor material on the said surface resulting in a new surface for a portion of the body;

(c) implanting further ions in the semiconductor material to form a second relatively high ion-concentration layer buried in the semiconductor material between the new surface and the first high ion-concentration layer, the further ions being of a type which is at least capable of making the second layer an insulating layer;

(d) forming source and drain regions in the semiconductor material between the first and second high ion-concentration layers;

(e) defining a gate region and a gate insulation region in the semiconductor material between the new surface and the second high ion-concentration layer and in the said second layer, respectively, and thereafter

(f) forming both a protective layer for the transistor and metallisation for electrical connections.

4,317,687

CARBURIZING PROCESS UTILIZING ATMOSPHERES GENERATED FROM NITROGEN-ETHANOL BASED MIXTURES

Jelle H. Kaspersma, Coopersburg, and Robert H. Shay, Kutztown, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed May 12, 1980, Ser. No. 148,854

Int. Cl.³ C21D *1/48*

U.S. Cl. 148—16.5 **6 Claims**

1. In a method of carburizing ferrous metal articles utilizing a mixture of nitrogen and ethanol injected into a furnace containing the articles to be carburized maintained at a temperature in excess of 1500° F. (816° C.) the improvement comprising:

adjusting the total input mixture by the addition of 0.31 liters of water to every liter of anhydrous (100%) ethanol, or 0.265 liters of water to every liter of commerical (95%) ethanol, to effect an input mixture of nitrogen, ethanol and water; and

controlling the carbon potential of said furnace atmosphere by adding a gas carburizing agent selected from the group consisting of natural gas containing substantially methane, propane, butane, ethane and mixtures thereof in an amount effective to achieve the desired furnace potential as determined by the furnace dimensions and geometry, furnace loading, composition of the articles being carburized, measured furnace temperature, case depth desired, composition of the gas carburizing agent and analysis of the furnace atmosphere during the carburizing cycle.

4,317,688

FLUX COMPOSITION FOR FLUX-CORED WIRE

Igor K. Pokhodnya, ulitsa Chkalova, 41a, kv. 25, and Vladimir N. Golovko, ulitsa Vladimirskaya, 9, kv. 29, both of Kiev, U.S.S.R.

Filed Jul. 9, 1980, Ser. No. 167,228

Int. Cl.³ B23K *35/34*

U.S. Cl. 148—24 **4 Claims**

1. Core flux composition of a flux-cored wire for welding and surfacing steels with a gas-shielded process, containing the core flux ingredients in the following amounts, by weight %:

rutile concentrate	20–40
fluorite concentrate	0.6–8.5
ferromanganese	13.5–18.5
ferrosilicon	1.6–2.7
nepheline concentrate	0.5–7
cryolite	0.6–4.5
iron powder	balance

4,317,689

MERCURY CONTAINMENT FOR LIQUID PHASE GROWTH OF MERCURY CADMIUM TELLURIDE FROM TELLURIUM-RICH SOLUTION

John E. Bowers, Mountain View, Calif., and Joseph L. Schmit, Hopkins, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 18, 1980, Ser. No. 170,324

Int. Cl.³ H01L *21/208*

U.S. Cl. 148—171 **7 Claims**

1. In a method of mercury containment in the liquid phase epitaxial growth of mercury cadmium telluride from a tellurium-rich solution having steps including,

providing a slider type graphite boat for use in a liquid phase epitaxy growth furnace,

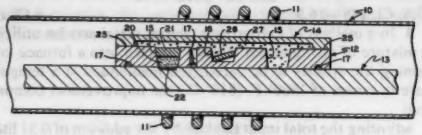
providing a well through the graphite boat,

providing a charge of Te-rich $(Hg_{1-x}Cd_x)_{1-y}Te_y$ into the well and providing a plug over the charge,

providing a boat base-member having a recess therein and providing a semiconductor substrate in said recess, the

base member and boat being slideably movable one with respect to the other to allow orientation of the well and recess when desired, so that when oriented, $Hg_{1-x}Cd_xTe$ can grown on said substrate,

providing a graphite cover over the graphic boat, and heating the boat in the growth furnace; the improvement comprising the step of



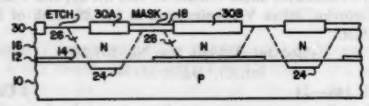
providing another mercury supplying charge beneath the cover to generate a Hg vapor pressure approximately equal to the Hg vapor pressure arising from the $(Hg_{1-x}Cd_x)_{1-y}Te_y$ charge to thereby contain and preclude loss of Hg from the charge of Te-rich $(Hg_{1-x}Cd_x)_{1-y}Te_y$.

4,317,690

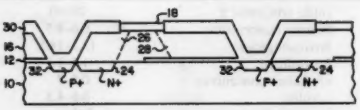
SELF-ALIGNED DOUBLE POLYSILICON MOS FABRICATION

Joannes J. M. Koomen, Los Altos, Calif., and Roelof H. W. Salters, Eindhoven, Netherlands, assignors to Signetics Corporation, Sunnyvale, Calif.

Filed Jun. 18, 1980, Ser. No. 160,668
Int. Cl.³ H01L *21/22, 21/31, 21/263*
U.S. Cl. 148—187 **14 Claims**



Third Mask Etch Nitride



P+ Implant Plus Oxidation

1. A method of fabricating a structure including a plurality of MOS transistors, comprising:

(a) providing a first layer of polysilicon over a substrate of first conductivity type;

(b) depositing over said first polysilicon layer a masking layer which provides a barrier to oxide formation;

(c) patterning said masking layer to form a plurality of spaced openings therein alternating with masking layer portions;

(d) introducing impurities of second conductivity type opposite said first conductivity type through said openings to increase the conductivity of said polysilicon layer in the regions beneath said openings and also to produce spaced apart surface regions of second conductivity type in said substrate;

(e) locally oxidizing said polysilicon layer in the areas uncovered by said oxidation barrier layer;

(f) removing alternate masking layer portions and the underlying polysilicon layer portions by selective etching to produce voids extending through said polysilicon layer;

(g) introducing impurities of first conductivity type through said voids to produce isolation regions in the surface of said substrate which separate said surface regions of second conductivity type into pairs, at least one surface region of second conductivity type alternating with one isolation region;

(h) oxidizing the bare sides of said polysilicon layer;

(i) removing the remaining masking layer portions and the underlying polysilicon layer portions by selective etching to provide yet other voids extending through said polysilicon layer, thereby exposing the surface of said substrate adjacent to said second conductivity type surface regions;

(j) forming a continuous insulating layer on the substrate surface thereby exposed in step (i) and also on the exposed sides of said polysilicon layer; and

(k) forming a second polysilicon layer over said continuous insulating layer.

4,317,691

LIQUID OR GELLED NITROPARAFFIN AND METAL PERCHLORATE CONTAINING EXPLOSIVE COMPOSITION

Takeshi Katsuta, Sagamihara; Yoshiyuki Ikeda, and Atsuo Inoue, both of Yamaguchi, all of Japan, assignors to Director, Technical Research and Development Institute, Japan Defence Agency and Nippon Kayaku Kabushiki Kaisha, both of Tokyo, Japan

Filed Dec. 10, 1979, Ser. No. 101,706
Claims priority, application Japan, Dec. 25, 1978, 53-158597
Int. Cl.³ C06B *25/00, 45/00*
U.S. Cl. 149—2 **4 Claims**

1. A liquid explosive composition in solution state consisting essentially of 2 to 40 weight percent of formamide, 2 to 40 weight percent of alocohol, 3 to 70 weight percent of nitroparaffin and 10 to 80 weight percent of a metal salt of perchloric acid.

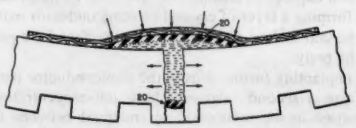
4. A gelled explosive composition consisting essentially of (a) more than 80 weight percent of a liquid explosive component in solution state comprising 2 to 40 weight percent of formamide, 2 to 40 weight percent of alcohol, 3 to 70 weight percent of notroparaffin and 10 to 80 weight percent of a metal salt of perchloric acid; and (b) not more than 20 weight percent of an additive comprising 2 to 20 weight percent of an organic thickening agent and/or 1 to 15 weight percent of an aerating agent.

4,317,692

INSIDE REPAIR FOR TUBELESS TIRE AND METHOD FOR APPLYING SAME

Alec W. Niconchuk, 267 Lowell St., Peabody, Mass. 01960

Filed Apr. 21, 1980, Ser. No. 142,358
Int. Cl.³ B60C *21/06*
U.S. Cl. 156—97 **8 Claims**



1. A method for making an inside repair of a puncture, including cracks collaterally thereof, on a cleaned and primed inner surface of a tubeless tire comprising the steps of:

(a) applying an uncured but air-curing elastomeric adhesive to the inner surface of said tire over said puncture and cracks,

(b) placing a porous patch over said adhesive,

(c) compressing said patch and uncured adhesive while confining the flow of said adhesive to force adhesive substantially into said puncture and cracks,

(d) allowing said adhesive at least partially to cure, and

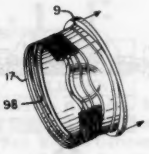
(e) inflating said tire while a substantial portion of said adhesive is still in the uncured state.

4,317,693

METHOD AND APPARATUS FOR FORMING FIBER REINFORCED COUPLING SLEEVES

Norman D. Reed, Frontenac, Kans., assignor to W. S. Dickey Clay Manufacturing Co., Pittsburg, Kans.

Filed Jun. 19, 1980, Ser. No. 160,859
Int. Cl.[3] B65H *81/00*; F16L *47/00*
U.S. Cl. 156—175 10 Claims



1. A method of fabricating a rigid pipe coupling of continuous strand fiber reinforced plastic comprising the steps of:

(a) placing an elastomeric and annular one-piece collar having an outer surface with a pair of axially spaced, annular irregularities extending inwardly therefrom on a mandrel while said mandrel is in a collapsed position and prior to applying the continuous strand fiber to said mandrel;

(b) radially expanding said mandrel to operably engage said collar prior to applying the continuous strand to said mandrel;

(c) applying to at least one substantially continuous strand a material which cures to a substantially rigid state;

(d) applying said strand to said outer surface of said collar and into said annular irregularity;

(e) curing said material thereby forming a rigid coupling with an inner surface having a pair of axially spaced circumferential ridges each extending inwardly into a respective annular irregularity;

(f) radially collapsing said mandrel;

(g) removing said collar and said coupling from said collapsed mandrel; an

(h) manipulating said elastomeric collar to remove same from said rigid coupling.

7. An apparatus for producing a rigid substantially annular member comprising:

(a) mandrel reversibly radially movable between an expanded position and a collapsed position and having a substantially cylindrical outer surface;

(b) an elastomeric, one-piece annular collar adapted to operably engage said cylindrical outer surface, said collar having an outer surface with a pair of axially spaced, annular irregularities extending inwardly therefrom;

(c) said collar being adapted to receive on said outer surface and in said annular irregularities thereof at least one continuous strand with a material applied thereto which cures to a substantially rigid state, said strand defining a substantially annular member;

(d) rotating means for rotating said mandrel and said collar as said strand is received by said collar;

(e) drying means to cure said material;

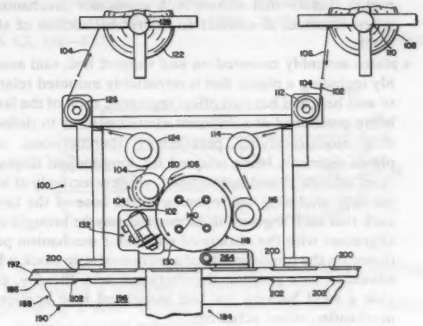
(f) control means for radially manipulating said mandrel between said expanded and said collapsed position thereof; said collar being removable from said mandrel when said mandrel is in the collapsed position thereof.

4,317,694

LAMINATE APPLYING MACHINE AND METHOD

Gilbert Fuchs; Norman Crowley, and Randall W. Wink, all of Evansville, Ind., assignors to Evana Tool & Engineering Company, Evansville, Ind.

Filed Aug. 27, 1980, Ser. No. 181,698
Int. Cl.[3] B32B *31/00*
U.S. Cl. 156—256 20 Claims



18. A method for applying an adhesive laminate to an elongate plate comprising

feeding an adhesive laminate, adhesive side out, to an operative conforming position on a convex surface,

feeding a plate to an operative position on a movable platform,

moving said platform to position only the upper side of one end of said plate into contact along a tangential area with said laminate; and

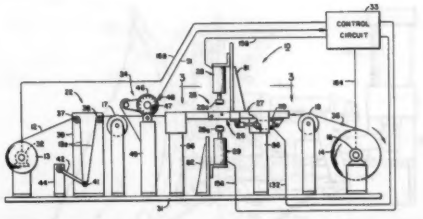
rolling said laminate from said contact area to the other end of said plate into adhesive planar contact with said plate.

4,317,695

TAPING APPARATUS WITH DUAL TAPE APPLICATOR MECHANISMS

Asar Madhu P., Reynoldsburg, and Richard A. Greene, Pickerington, both of Ohio, assignors to Western Electric Company, Incorporated, New York, N.Y.

Filed Nov. 26, 1980, Ser. No. 210,703
Int. Cl.[3] B32B *31/00*
U.S. Cl. 156—353 20 Claims



1. An apparatus for positioning an array of material strips at predetermined spaced intervals along each side of a supply of indexably advanced strip stock, with corresponding material strips in said two arrays being at least substantially co-extensive, said apparatus comprising:

means for indexably advancing a supply of strip stock along a longitudinally disposed path;

separate material strip applicator mechanisms positioned in mutually disposed and aligned relationship, and spaced apart a distance sufficient to normally allow strip stock to be advanced along said path therebetween, each of said

applicator mechanisms being adapted, when actuated, to sever a predetermined length of strip material from a supply thereof, and position said several material strip on an adjacent side region of the strip stock each time the latter is momentarily stopped;

a strip stock support bed interposed between said mutually disposed material strip applicator mechanisms, the base of said support bed having an opening along an intermediate region thereof that allows both applicator mechanisms, when actuated, to contact an interposed section of strip stock;

a platen assembly mounted on said support bed, said assembly including a platen that is retractably mounted relative to said bed, and has two offset segments, each of the latter being positioned at a different elevation so as to define a strip stock-receiving passageway therebetween, said platen segments being adapted for longitudinal displacement relative to said support bed, while selectively at least partially enclosing said opening in the base of the latter, such that each segment in succession may be brought into alignment with the associated applicator mechanism positioned on the opposite side of a section of strip stock when advanced to a position therebetween and, thereby, provide a solid backing for said associated tape applicator mechanism, when actuated;

means for retractably displacing said platen segments, in succession, into alignment with the respectively associated tape applicator mechanisms, and

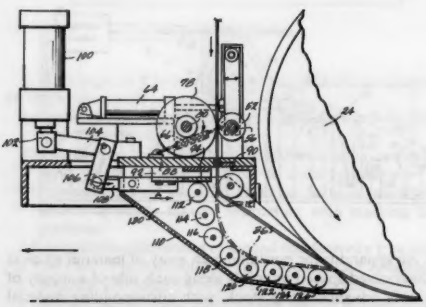
circuit means for controlling the incremental advancement of a supply of strip stock along said path, and for sequentially actuating said tape applicator mechanisms in timed relation with the dwell periods of such strip stock, and the displacement of said platen segments successively into alignment with said respectively associated applicator mechanisms, so as to effect the successive positioning of corresponding material strips on opposite sides of such strip stock at each predetermined spaced interval therealong.

4,317,696

APPARATUS FOR APPLYING PLASTIC TAPE

Robert S. Hutchinson, Montoursville, and William L. Greiner, III, Muncy, both of Pa., assignors to Prismo Universal Corporation, Montgomery, Pa.

Filed Mar. 19, 1980, Ser. No. 131,764
Int. Cl.³ B32R *31/20*; E01C *23/16*
U.S. Cl. 156—523 **14 Claims**



1. An apparatus for mounting on a vehicle having a pressure roller and a plastic tape dispenser to apply plastic tape to pavement comprising:

a frame adapted for being mounted on said vehicle adjacent said pressure roller, including a horizontal plate having a slot through which said tape is advanced;

driving means mounted on said plate for engaging and advancing said tape in a first position and disengaged from said tape in a second position;

cutter means mounted on said frame beneath said plate adjacent said slot for actuation to cut said tape; and

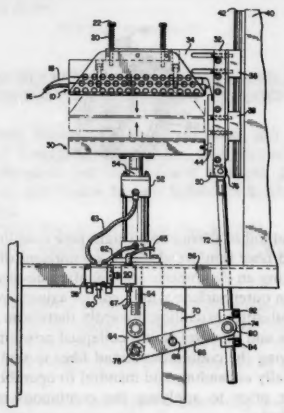
guide means mounted on said frame for guiding the tape between said pressure roller and the pavement.

4,317,697

SEALING MECHANISM

John R. McLean, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Sep. 29, 1980, Ser. No. 191,828
Int. Cl.³ B30B *15/04, 15/34*
U.S. Cl. 156—583.1 **5 Claims**



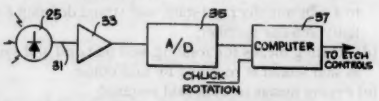
1. A heat sealing apparatus comprising an upper sealing member, a lower sealing member, an air cylinder for moving said lower sealing member in an upward direction, linkage means connected to said air cylinder for moving said upper sealing member in a downward direction, a pivotable bar for controlling the relative amounts of vertical movements of said upper sealing member and said lower sealing member and means for spacing said upper sealing member from said lower sealing member prior to movements thereof, said means for spacing comprising a mounting bracket connected to said upper sealing member, an adjustable collar connected to said pivotable bar and a connecting rod mounted between said mounting bracket and said adjustable collar.

4,317,698

END POINT DETECTION IN ETCHING WAFERS AND THE LIKE

James T. Christol, Cupertino, and John S. Burchard, Santa Clara, both of Calif., assignors to Applied Process Technology, Inc., Santa Clara, Calif.

Filed Nov. 13, 1980, Ser. No. 206,490
Int. Cl.³ C23F *1/02*
U.S. Cl. 156—626 **8 Claims**



1. A method for establishing the end point of etching major surfaces of coated reflective surfaces comprising,

(a) directing light from a source onto a major surface of a

coated reflective material being etched during an etch cycle,

(b) detecting the amplitude of reflected light from said material and producing a first electrical signal representing the diffusely reflected light during an etch cycle,

(c) using the derivative of the amplitude of reflected light to anticipate the end of etching by computing the cycle time when the etch cycle should be braked, said anticipation based upon finding the inflection level to the derivative,

(d) braking the etch cycle at said cycle time.

4,317,699

METHOD FOR MANUFACTURE OF BRANCH ELEMENT

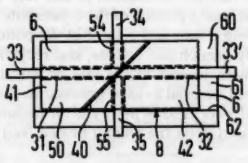
Gerhard Winzer, and Franz Auracher, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Nov. 13, 1979, Ser. No. 93,519

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1978, 2851679

Int. Cl.³ G02B 5/14

U.S. Cl. 156—629 14 Claims



1. A method of manufacturing a branch element having two main light waveguides axially aligned and having end faces separated by a partially reflective layer and at least one branch light waveguide extending from the end of one of the main waveguides and the reflective layer, said method comprising the steps of providing an initial member consisting of material exhibiting the same polishing properties as the light waveguides; forming a first groove for a guide channel for a light waveguide and at least one branch groove extending from the first groove for receiving a branch light waveguide in a surface of said initial member; inserting and securing a continuous light waveguide in the first groove and a branch waveguide in each branch groove with an end face in contact with a cylindrical surface of the continuous light waveguide; then cutting said member along a plane extending at an angle to the first groove and at a point spaced from each intersection of the axes of the continuous light waveguide and a branch waveguide secured in said grooves to form two parts having cut surfaces and to divide the continuous waveguide into two main waveguides; polishing the cut surfaces of each part and the end face of the main waveguide associated therewith, said steps of cutting and polishing locating the plane of cutting so that after the step of polishing the polished surface of the part lies in the intersection of the axes of the branch waveguide and the main waveguide; applying a partially reflective coating to at least part of the polished end face of one of said two parts to cover at least a portion of the polished end face of the main waveguide of the part; bringing the two parts into contact with each other with the partially reflective coating therebetween and with the axes of the main waveguides being axially aligned; and securing the parts together to form the element.

4,317,700

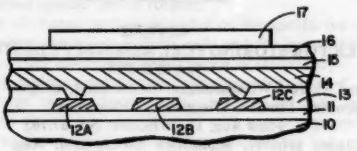
METHOD OF FABRICATION OF PLANAR BUBBLE DOMAIN DEVICE STRUCTURES

Kunihide Tanaka, Irvine; Michael T. Elliott, Carbon Canyon; Sam Chung, Costa Mesa; James Pau, Irvine; Linda Gray, Fullerton; Liping D. Hou, Seal Beach; Mary F'Mayer, Garden Grove; David Warren, Fullerton, and Karen Finch, Mission Viejo, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 20, 1980, Ser. No. 179,843

Int. Cl.³ B44C 1/22; C03C 15/00, 25/06

U.S. Cl. 156—652 14 Claims



1. A method of fabricating a bubble domain device composite structure on a substrate comprising the steps of:

providing a layer capable of supporting magnetic bubble domains on said substrate;

depositing a barrier layer of a suitable polymeric dielectric material on said layer;

subsequently depositing a layer of electrically conductive material over said barrier layer;

subsequently depositing a spacer layer of a polymeric dielectric material in a liquid state over said conductive layer;

processing said spacer layer to a solid state so that the surface of the spacer layer is substantially planar; and

subsequently depositing a layer of a magnetically operative material over the spacer layer.

4,317,701

APPARATUS FOR TREATING WASTE-PAPER

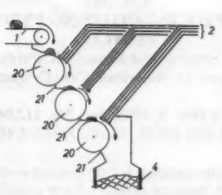
Lothar Pfalzer, and Holzwirt Siegbert/Fischer, both of Heidenheim, Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Fed. Rep. of Germany

Division of Ser. No. 961,232, Nov. 16, 1978, abandoned. This application Jun. 10, 1980, Ser. No. 158,319

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1977, 2751084

Int. Cl.³ D21C 7/00, 7/06, 7/08

U.S. Cl. 162—234 7 Claims



1. Apparatus for treating waste paper in a stock density range of more than 10%, said apparatus comprising:

tumbling means including a device for tumbling the waste paper for pulping it, said tumbling device comprising a plurality of rotating elements, each of said rotating elements arranged to receive waste paper on top thereof and each rotating element being structurally arranged to rotate to move the waste paper to fall free of that said rotating element, said rotating elements being arranged one above the other in stepped fashion and being so stepped that as waste paper falls free of one said rotating element, it falls to the top of said rotating element beneath;

chemical liquid dispensing means for dispensing chemical liquid on to each said rotating element for impregnating the waste paper;

means for delivering waste paper onto the top said rotating element of said plurality of rotating elements;

a reaction tower located to receive tumbled waste paper that leaves said tumbling device, said reaction tower having an upper section at which tumbled waste paper is received and a lower section with an outlet opening from which pulped paper leaves said reaction tower; and

a discharging device communicating through said outlet opening for discharging pulped paper from said reaction tower.

4,317,702

RACK FOR STORING FUEL ASSEMBLY CLUSTERS IN A WATER PIT

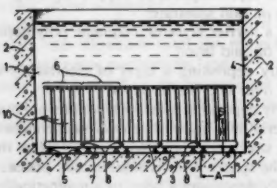
Hans Akeret, Wiesendangen, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Aug. 17, 1979, Ser. No. 67,703

Claims priority, application Switzerland, Aug. 17, 1978, 8752/78

Int. Cl.³ G21C *19/20*; G21F *5/00*

U.S. Cl. 376—272 **9 Claims**



1. A rack for storing fuel assembly clusters in a water pit, said rack comprising

at least two rows of rack elements, each said rack element having a bed plate, a plurality of vertically disposed square receiving tubes mounted thereon in closely spaced relation to each other, each said tube having an inwardly directed flange adjacent said bed plate, and bolts passing through each flange and said bed plate for bolting said tubes to said bed plate; and

means connecting adjacent bed plates of said rack elements to each other at least in fixed vertical relation to each other.

4,317,703

PYROLYSIS PROCESS UTILIZING PYROLYTIC OIL RECYCLE

Mack D. Bowen, Smyrna, and Kenneth R. Purdy, Decatur, both of Ga., assignors to American Can Company, Greenwich, Conn.

Filed Dec. 3, 1980, Ser. No. 212,041

Int. Cl.³ C10B *39/04, 49/06, 53/02*; C10K *1/18*

U.S. Cl. 201—1 **32 Claims**

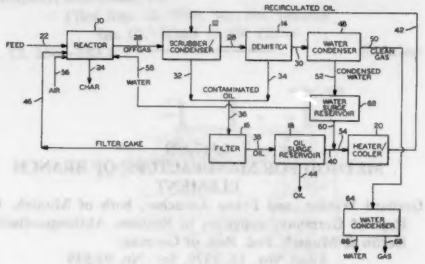
1. In a continuous process for producing a solid residue and a clean, enriched gaseous product from a cellulosic material that pyrolyzes to a solid residue and a gaseous mixture, which gaseous mixture comprises condensible organic vapors and water vapor, and noncondensible fractions, the steps comprising;

(a) continuously pyrolyzing a feed of said cellulosic material as a moving packed bed in which the temperature varies, and passes through a maximum value of about 760° to 1150° Celsius at an intermediate level, to produce said residue and said gaseous mixture, said gaseous mixture having entrained therein a significant amount of fine particles of said residue, and having a temperature of about 110° to 400° Celsius;

(b) injecting pyrolytic oil into said gaseous mixture to scrub said residue particles therefrom and to effect condensation of a portion of said condensible vapors thereof, thereby enabling recovery of a relatively clean gaseous product and a pyrolytic oil mixture containing said residue particles;

(c) filtering said pyrolytic oil mixture to separate it into an oil portion and a filter cake, said filter cake containing pyrolytic oil and residue particles in a weight ratio of about 1 to 10:1;

(d) recycling said filter cake by introducing it into said bed at a subsurface level at least about two feet below the surface of said bed, above said intermediate level and at which the temperature is at least about 260° Celsius, for cracking of said oil contained in said filter cake;



(e) recycling said oil portion of said pyrolytic oil mixture to provide said injected pyrolytic oil of said step (b);

(f) effecting the condensation and recovery of a substantial amount of the organic vapors and water vapor present in said gaseous mixture subsequent to said step (b); and

(g) recycling at least a portion of the condensate from said step (f) by injecting it into said residue at the bottom of said bed to effectively quench said residue, said recycling steps being controlled with respect to the rate of introduction of said cellulosic feed material so as to produce an enriched gaseous product, and a net yield of pyrolytic oil amounting to at least 3 percent based upon the weight of said feed.

4,317,704

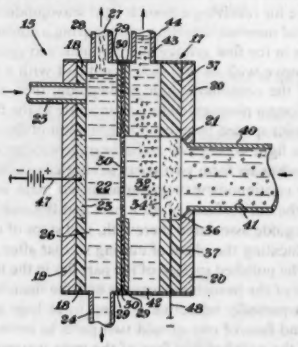
METHOD OF OPERATING AN ELECTROLYTIC CELL

James A. McIntyre, and Robert F. Phillips, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 882,834, Mar. 2, 1978, Pat. No. 4,224,129. This application Jul. 2, 1980, Ser. No. 165,445

Int. Cl.³ C25B *1/34*

U.S. Cl. 204—1 R **17 Claims**



1. A method of operating an electrolytic cell comprising:

forming a gas-liquid mixture of an oxygen-containing gas and a catholyte; and

flowing the mixture through interconnecting passageways

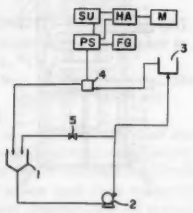
of a porous cathode, while the cathode is maintained at a voltage sufficient to reduce at least a portion of the oxygen as the mixture flows through the cathode, wherein the cathode comprises a plurality of electroconductive screens.

4,317,705

METHOD FOR MEASURING CONCENTRATION OF OXIDANT OR REDUCTANT

Sumio Hamada; Kenji Usui, and Takeshi Noguchi, all of Tokyo, Japan, assignors to Nissan Engineering Ltd., Tokyo, Japan

Division of Ser. No. 112,289, Jan. 15, 1980, abandoned. This application Jan. 5, 1981, Ser. No. 222,625
Claims priority, application Japan, May 28, 1979, 54-65759
Int. Cl.³ G01N *27/46, 27/52*
U.S. Cl. 204—1 T **1 Claim**



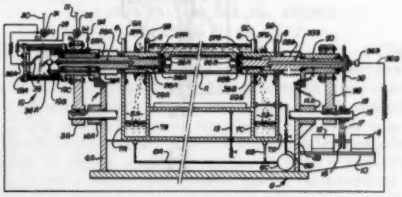
1. A method of continuously measuring the concentration of an oxidant or reductant which comprises flowing in an electrolytic cell as a laminar flow a solution containing an oxidant or reductant, measuring the concentration of said oxidant or reductant by means of a potentiostat to which is connected an electric potential sweeping device which is a continuous functional wave generator, and effecting said measurement of the concentration while applying to the solution in the electrolytic cell an alternating rectangular or pulse voltage having a frequency of 40 to 0.1 Hz. wherein the alternations oscillate between a first voltage which is an applied negative potential higher than the electrolysis potential of water, and a second voltage which is an applied positive potential, whereby said first voltage effects contamination removal and said second voltage effects adsorbed ion removal from the electrode surface.

4,317,706

APPARATUS FOR PLATING A PRINTING ROLLER

Susumu Saito, Kashiwa, Japan, assignor to Shinku Laboratory Co., Ltd., Chiba, Japan

Filed Jul. 9, 1980, Ser. No. 167,107
Int. Cl.³ C25D *17/00, 17/02, 3/00*
U.S. Cl. 204—198 **4 Claims**



1. An apparatus for plating an outer circumferential surface of a hollow roller of the type including a plating tank and an additional work station such as a pretreatment tank, after treatment tank or mounting and dismounting board, said apparatus comprising:

a pair of swing arms swingable between the additional work station and the plating tank;

a means for swinging said swing arms from said additional work station to said plating tank and back to said additional work station;

a means for automatically mounting and dismounting the roller provided on ends of the swing arms, said means comprising:

a first spindle rotatably and slidably coupled to one of the swing arms such that the first spindle can be rotated and axially moved;

a second spindle facing said first spindle and rotatably coupled to another one of said swing arms such that said second spindle can be rotated;

a pair of charge carriers provided on the spindle for supporting the roller at both ends and for providing an electrical connection to both ends of said roller;

liquid leakage prevention caps provided around the charge carriers facing each other and movable in an axial direction for engagement with and disengagement from the ends of the roller for preventing the leakage of a process solution to the inside surface of the roller;

a means for axially moving said first spindle;

a means for rotating said second spindle; and

a means for axially moving said liquid leakage prevention caps; and

a pair of notches provided in opposite sides of said plating tank whereby said means for automatically mounting and dismounting the roller can be fitted into said plating tank; and

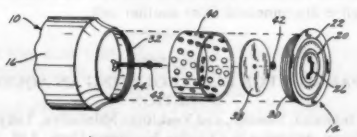
a pair of leak prevention plate provided on each of said notches, each of said leak prevention plates being arranged and configured such that said pair of notches are sealed when said means for automatically mounting and dismounting the roller is fitted into said plating tank whereby the plating liquid level in the plating tank can be set higher than an upper surface of said roller.

4,317,707

PORTABLE ELECTROLYSIS UNIT FOR RECOVERY OF SILVER FROM PHOTOGRAPHIC FILM

David L. Good, 3708 Hickman Rd., Des Moines, Iowa 50310, and Dallis L. Good, P.O. Box 1354, Middlesboro, Ky. 40965

Filed Nov. 3, 1980, Ser. No. 203,312
Int. Cl.³ C25C *7/00, 7/02*
U.S. Cl. 204—213 **17 Claims**



1. A portable electrolysis device for recovering silver from photographic film, comprising:

an elongated cylindrical drum wherein the electrolysis and recovery of silver from photographic film takes place, said drum having a cylindrical side wall and a forward and rearward end, said forward end having a circular end cap detachably secured over said forward end;

an interior cylindrical mesh basket mounted within said drum and attached to said end cap;

said end cap having separate positive and negative electrical contact means located on the exterior surface thereof;

a cathode plate operatively mounted within said mesh basket; whereby said mesh basket prevents said film from contacting said cathode plate;

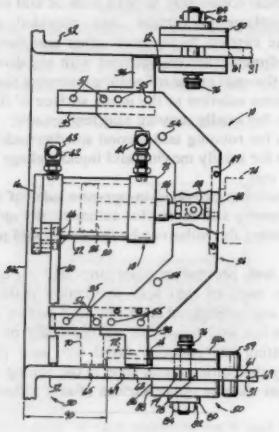
at least one anode mounted within said mesh basket in spaced relation to said cathode plate;

first connecting means providing electrical connection between said cathode plate and said negative contact means;
second connecting means providing electrical connection between said anode and said positive contact means;
an elongated base having a bearing means for supporting and rotating said drum about its longitudinal axis.

4,317,708
REMOTE-CONTROLLED JACK FOR INTERCELL CONNECTORS

Steven J. Specht, Mentor, Ohio, and Morton S. Kircher, Clearwater, Fla., assignors to Olin Corporation, New Haven, Conn.

Filed Dec. 7, 1979, Ser. No. 101,294
Int. Cl.³ C25B *9/04, 15/02*
U.S. Cl. 204—228 **13 Claims**



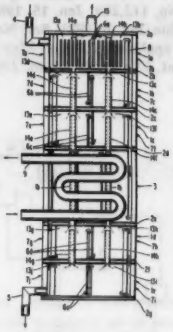
1. A remote-controlled intercell connector bar jack which comprises:
first contactor means for contacting an intercell connector;
second contactor means for contacting a cell wall of a cell;
pusher means, connecting said first and second contactor means for expanding to push said first contactor against said intercell connector and to move said first contactor means and said intercell connector means away from said second contactor means and said cell wall whereby said cell is disconnected from another cell.

4,317,709
APPARATUS FOR ELECTROLYZING AN AQUEOUS SOLUTION

Teruo Ichisaka, Tamano, and Yoshitugu Shinomiya, Tokyo, both of Japan, assignors to Chlorine Engineers Corp., Ltd., Tokyo, Japan

Filed Jun. 26, 1980, Ser. No. 163,137
Claims priority, application Japan, Jun. 26, 1979, 54-79731
Int. Cl.³ C25B *9/00, 15/08*
U.S. Cl. 204—268 **6 Claims**

1. In an apparatus for electrolyzing an aqueous solution, which includes a plurality of electrolytic cells disposed at a plurality of vertically spaced levels and divided by partitions from one another, each of said cells having at least one anode and at least one cathode, said cells including an uppermost cell having an inlet for said solution, and a lowermost cell having an outlet for said solution, the improvement wherein:
(a) each of said cells is separated by at least one dividing wall structure into at least two horizontally adjacent cell units;
(b) said dividing wall structure is adapted to direct the flow of said solution from the top of one of said cell units into the bottom of adjacent cell unit, thereby enabling said solution to flow successively through each cell unit;
(c) a last cell unit of each cell is provided with an opening defining a passage extending from the top of said last cell unit to the bottom of a cell unit at a lower level immediately below said last cell unit to direct the flow of said solution downwardly from said last cell unit into said cell unit at said lower level;
(d) said anode and said cathode are vertically disposed in each said cell unit opposite to each other, and form a

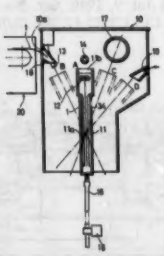


bipolar electrode assembly extending between said adjacent cell units; and
(e) each said cell unit has a gas collecting zone defined above said anode and said cathode, and is provided with a gas riser extending from one of said partitions defining the bottom of said each cell unit to said gas collecting zone in which said gas riser has one open end, said gas riser having another end extending through said one partition and opening toward the gas collecting zone in the cell unit immediately below said each cell unit, said uppermost cell being provided at its top with a gas outlet.

4,317,710
COLORING-DECOLORING-DRYING APPARATUS FOR ELECTROPHORESIS

Hideo Suzuki, Tokyo, and Ryo Fujimori, Hachiouji, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 16, 1980, Ser. No. 197,742
Claims priority, application Japan, Oct. 18, 1979, 54-134625
Int. Cl.³ G01N *27/26*
U.S. Cl. 204—299 R **9 Claims**



1. A carrier coloring-decoloring-drying apparatus for electrophoresis, comprising:
a coloring-decoloring container having opening means used for insertion of a carrier of predetermined length into said container, for pouring coloring and decoloring liquid agents into said container, and a drain port;

a pair of rollers arranged inside said coloring-decoloring container and used for inserting and sending out said carrier;

said apparatus being so arranged that when the carrier having been subjected to electrophoresis is fed into said coloring-decoloring container through said opening means by rotating said rollers in feeding contact with the carrier, said carrier is kept in suspended condition with its rear end held between said rollers while a coloring liquid agent is poured into said container through said opening means to color said carrier, said coloring liquid agent is then discharged from said container through said drain port, a decoloring liquid agent is then poured into said container through said opening means to decolor said carrier, said decoloring liquid agent is then discharged from said container through said drain portion, and then said carrier is dried by blowing a hot air blast through said opening means.

4,317,711

COPROCESSING OF RESIDUAL OIL AND COAL

Tsoung Y. Yan, Philadelphia, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 12, 1980, Ser. No. 186,927
Int. Cl.³ C10G 1/00
U.S. Cl. 208—8 LE 11 Claims

1. A process for heavy hydrocarbon oil demetallation which comprises (1) heating an admixture of heavy hydrocarbon oil and particulate coal under visbreaking conditions; (2) removing a light end fraction and then subjecting the visbroken admixture to solvent deasphalting to provide an oil fraction and a precipitated asphaltic solids fraction; and (3) distilling the said oil fraction to remove the deasphalting solvent and yield a demetallized liquid hydrocarbon product.

4,317,712

CONVERSION OF HEAVY PETROLEUM OILS

Malvina Farcasiu, Princeton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 144,803, Apr. 29, 1980, abandoned. This application Apr. 14, 1981, Ser. No. 254,330
Int. Cl.³ C10G 11/08
U.S. Cl. 208—46 17 Claims

1. A process for converting a heavy substantially nonvolatile petroleum oil which comprises adding 0.1 to 10 parts by weight of one or more light aromatic hydrocarbons per part of heavy oil and contacting said mixture with an amount of Friedel Crafts catalyst for from about 0.2 to 5 hours at a temperature from about 176° F. (80° C.) to about 660° F. (350° C.), said amount of catalyst being effective to convert at least 10 wt.% of said heavy oil to volatile alkylaromatic products.

4,317,713

IN SITU ALUMINUM PASSIVATION PROCESS

Emmett H. Burk, Jr., Glenwood; Jin S. Yoo, Flossmoor, and John A. Karch, Chicago, all of Ill., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Filed May 19, 1980, Ser. No. 150,862
Int. Cl.³ C10G 11/18, 47/12
U.S. Cl. 208—113 6 Claims

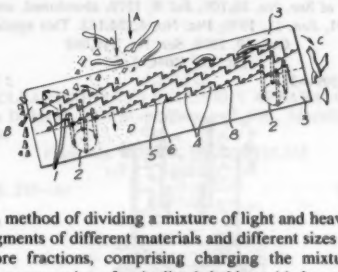
1. In a process for converting a hydrocarbon material having at least one metal contaminant selected from the group consisting of nickel, vanadium, iron and copper which comprises contacting the hydrocarbon material in a reaction zone at hydrocarbon conversion conditions with a catalyst comprising a phase of soluble aluminum species to form a conversion product and a deactivated catalyst having carbonaceous deposits and containing at least a portion of said metal contaminants, and regenerating said deactivated catalyst to restore at least a portion of its catalytic activity by removing at least a portion of said carbonaceous deposits to form a regenerated catalyst, the improvement which comprises: contacting said regenerated catalyst with a medium for a time and at a temperature so as to cause at least a passivating amount of said soluble aluminum species to transfer from said phase to said medium and then causing at least a portion of said amount of said soluble aluminum species to transfer from said medium back to said catalyst, whereby the deleterious effects of said at least one metal contaminant on said catalyst are reduced.

4,317,714

METHOD AND APPARATUS FOR DIVIDING A MIXTURE OF PIECES OR FRAGMENTS OF DIFFERENT MATERIALS AND HAVING DIFFERENT SIZES INTO TWO OR MORE FRACTIONS

Sven E. Forslund, Ingarö, Sweden, assignor to AZ Sellbergs AB, Stockholm, Sweden

Continuation of Ser. No. 872,854, Jan. 27, 1978, abandoned. This application Mar. 19, 1980, Ser. No. 131,677
Claims priority, application Sweden, Jan. 28, 1977, 7700928
Int. Cl.³ B07B 15/00
U.S. Cl. 209—44 8 Claims



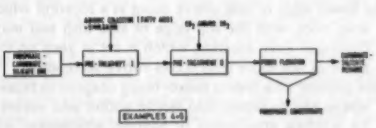
1. A method of dividing a mixture of light and heavy pieces or fragments of different materials and different sizes into two or more fractions, comprising charging the mixture from above onto a region of an inclined shaking table located below the center of the table, the table being driven from two longitudinally spaced rotary shafts to perform cyclical movements longitudinally of the table surface and up and down vertically relative to the said surface, the table having at least one inclined surface which is inclined downwards towards the lower end of the shaking table at an angle which is more steeply inclined than an imaginary line connecting the axes of the two rotary shafts, so that rebounding heavy fragments and pieces bounce down to the lower end of the table as one fraction, and friction elements mounted on the shaking table which aid in moving the other fraction to the upper end of the table, the speed of rotation of the shafts and their amplitude being so adjusted as to provide the desired bouncing movement.

4,317,715

PROCESS FOR THE SELECTIVE FROTH-FLOTATION OF PHOSPHATE AND CARBONATE MINERALS FROM FINELY-DIVIDED PHOSPHATE-CARBONATE-SILICATE ORES OR CONCENTRATES

Väinö. V. H. Hintikka, Pori, and Kaarlo M. J. Saari, Vanha-Ulvila, both of Finland, assignors to Outokumpu Oy, Helsinki, Finland

Continuation of Ser. No. 957,460, Nov. 3, 1978, abandoned. This application Nov. 14, 1980, Ser. No. 207,339
Claims priority, application Finland, Nov. 22, 1977, 773533
Int. Cl.³ B03D 1/02
U.S. Cl. 209—167 4 Claims



3. A process for the separate recovery of phosphate and

carbonate minerals from finely-divided phosphate-carbonate-silicate ores or concentrates with a carbonate to phosphate ratio greater than 1, comprising adding an anionic collector agent to an aqueous slurry of these ores or concentrates; subjecting the slurry to froth-flotation in order to separate a silicate-bearing residue from a phosphate-carbonate concentrate, treating the phosphate-carbonate concentrate with a base at a raised pH of about 11–12 in order to remove collector-agent coatings from the surface of the mineral particles, and finally lowering the pH and subjecting the combined concentrate to further froth-flotation with a cationic collector agent, and using a depressing agent for carbonate in order to separately recover a phosphate concentrate and a carbonate concentrate.

4,317,716

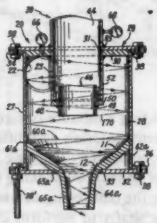
VORTEX FINDER AND SLEEVE KIT

Delbert I. Liller, P.O. Box 64, Deer Park, Md. 22150

Division of Ser. No. 56,109, Jul. 9, 1979, abandoned, and Ser. No. 2,731, Jan. 11, 1979, Pat. No. 4,224,143. This application Oct. 10, 1980, Ser. No. 196,068

Int. Cl.³ B04C *5/14*

U.S. Cl. 209—211 **2 Claims**



1. In combination, a vortex finder and kit for bottom insertion of a sleeve into said vortex finder which in a cyclone having a circular bowl of inner diameter B, a dish at the bottom of said bowl and an outlet at the top and in which said kit provides a sleeve for adjusting the flow of light fractions out from the top outlet of said cyclone, the combination comprising,

a kit having a plurality of sleeves of circular cross sections, each sleeve being of the same length, and each same length being related to the inner diameter of said bowl B by being at least 0.3B;

each sleeve of said plurality of sleeves having a different diameter from the other sleeves in said plurality of sleeves to form a set of sleeves of different diameters between an upper limit of 0.5B where B is the inner diameter of said cyclone bowl, and a lower limit of 0.3B whereby the diameter of any one sleeve of the set when attached within said vortex finder serves as the sole means of restricting the outflow of light fractions out of the top of said cyclone by restricting the diameter of the sleeve between 0.3B and 0.5B;

a circular attachment means securing the one of said sleeves of different diameter which is selected for the diameter restricting the flow to a desired degree within the vortex finder;

the lower edge of said sleeve being at a location which is at least even with the top edge of said dish and may vary from said even location which is set at zero up to a distance of not more than 0.26B above zero; and

said circular attachment means being adapted to receive said sleeve and to secure said sleeve within said vortex finder by welding attachment or bayonet attachment when an old sleeve is removed and a new sleeve inserted into said attachment means.

4,317,717

NONMAGNETIC CONDUCTIVE MATERIAL SEPARATING APPARATUS

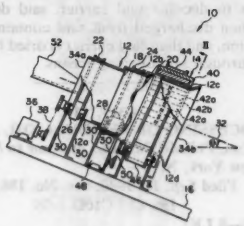
Takato Nakajima, Sakaki, Japan, assignor to Kanetsu Kogyo Kabushiki Kaisha, Ueda, Japan

Filed Nov. 24, 1980, Ser. No. 209,310

Claims priority, application Japan, Dec. 12, 1979, 55-170981[U]; Dec. 12, 1979, 55-170982[U]

Int. Cl.³ B03C *1/12*

U.S. Cl. 209—212 **8 Claims**



1. A nonmagnetic conductive material separating apparatus comprising:

a drum disposed in a tilted fashion and rotating in one direction about the longitudinal central axis thereof, said drum being formed of a nonmagnetic material;

a means for supplying a mixture material to be separated into said drum from the upper opening of said drum;

a means for producing a shifting magnetic field for exerting an electromagnetic force reverse to a direction of rotation of said drum on a nonmagnetic conductive material contained in the mixture material moving in the drum toward the lower opening of said drum, while being agitated by rotation of said drum; and

a shoulder portion extending along the inner peripheral wall of said drum for increasing the agitation efficiency for said mixture material moving in said drum, said shoulder portion changing the movement of the mixture material through said drum.

4,317,718

GLASS SEPARATION APPARATUS

Malcolm M. Paterson, Lee, N.H., assignor to Raytheon Company, Lexington, Mass.

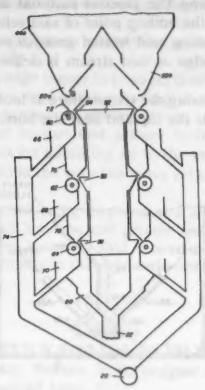
Filed May 3, 1976, Ser. No. 682,699

Int. Cl.³ B03C *1/26*

U.S. Cl. 209—215 **4 Claims**

1. A system for separating particles of glass or silica from particles of magnetic material in a commingled supply thereof, comprising the combination of a first pressure vessel for receiving said commingled materials, a magnetic separator, first conduit means connecting the separator to the pressure vessel, air control means for injecting pulses of air at spaced intervals into the pressure vessel whereby small batches of said commingled materials are intermittently directed from the vessel to the separator through the first conduit at a low velocity, means within the separator for separating the commingled materials into separate magnetic and nonmagnetic fractions, second and third pressure vessels, second conduit means for directing separated magnetic particles from the separator to said second pressure vessel, third conduit means for directing separated nonmagnetic particles from the separator to the third pressure vessel, and air control means for injecting pulses of air at

spaced intervals into said second and third pressure vessels whereby small batches of the separated materials in the vessels



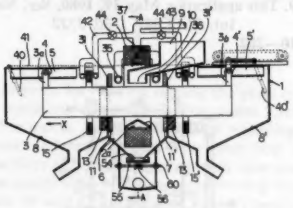
are intermittently fed from the second and third pressure vessels to respective collection areas at a low velocity.

4,317,719

WET-TYPE MAGNETIC ORE SEPARATION APPARATUS

Tomotoshi Tokuno, 15-20, Shingashi 1-chome, Itabashi, Tokyo, Japan

Filed Oct. 6, 1980, Ser. No. 194,272
Int. Cl.³ B03C 1/02
U.S. Cl. 209—223 R **1 Claim**



1. A wet-type magnetic ore separation apparatus comprising:

a vertically positioned electromagnetic coil having a center opening extending therethrough;

a movable frame member having a plurality of magnetic pole means mounted therein and horizontally and reciprocally movable through said opening in the electromagnetic coil;

a funnel-shaped center chamber substantially surrounding said electromagnetic coil for collecting non-magnetic component contained in a charge of ore material and having means for maintaining a liquid level therein adjacent the top of said frame member;

a pair of demagnetization coils spaced from the opposite sides of said electromagnetic coil and extending around said movable frame member for demagnetizing said magnetic pole means for enabling magnetic component to be separated from said magnetic pole means to which said magnetic component has previously been attracted;

funnel-shaped side chambers on the opposite sides of said center chamber in the direction of movement of said movable frame member and into which said frame member is movable for collecting said magnetic component from said magnetic pole means;

first and second water pipes provided on the opposite sides of said electromagnetic coil above said movable frame member for washing away non-magnetic component trapped in said magnetic component; and

third and fourth water pipes provided adjacent said demagnetizing coils for washing away magnetic component remaining on said magnetic pole means;

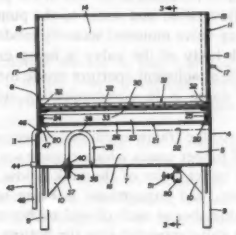
said magnetic pole means being an assembly of vertically extending plates each having a plurality of vertically spaced flat triangular projections extending laterally of the plate member with the projections lying in a substantially vertical plane, said plates being side by side in rows extending across said frame member with unobstructed vertical spaces therebetween, the rows of plate members being spaced transversely of the direction in which the rows extend and the projections in adjacent rows projecting toward each other and the projections in adjacent rows being vertically staggered and internesting with each other and having narrow spaces therebetween.

4,317,720

CLEANING FLUID RECOVERY APPARATUS

Eugene D. Hawk, 2837 Manchester Ave., SW., Massillon, Ohio 44646

Filed Sep. 18, 1980, Ser. No. 188,543
Int. Cl.³ B03D 3/00
U.S. Cl. 210—86 **9 Claims**



1. Cleaning fluid recovery apparatus including:

(a) a tank having side, bottom, front and back walls forming a container having an open top for receiving and holding a quantity of cleaning fluid and water in which the cleaning fluid has a lighter specific gravity than the water thereby forming a layer of cleaning fluid on top of the water;

(b) a screen mounted on the tank adjacent the open top of the container for supporting an article to be cleaned;

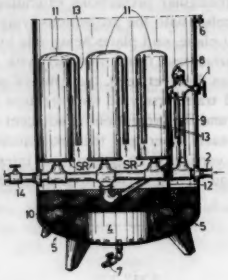
(c) a tray removably mounted on the tank below and closely adjacent to the screen, said tray having an imperforate bottom wall for the collection and retention of dirt and sludge removed from an article being cleaned; and

(d) an inverted generally U-shaped drain pipe extending upwardly from the bottom wall of the container, said drain pipe having inlet and outlet ends and an intermediate curved portion, said inlet end being located closely adjacent to the bottom wall of the container within said container and the outlet end being located beneath said bottom wall, whereby the water will start to flow out of the container through the outlet end of the drain pipe upon the level of the water reaching an inside radius of the curved portion of the pipe with the cleaning fluid remaining in the tank in a layer on top of the water, with additional amounts of water flowing out of the drain pipe in direct relationship to additional amounts of water flowing into the container during subsequent cleaning operations.

4,317,721
INSIDE FLOW FILTER

Pentti Pynnönen, 19650 Joutsa, Finland

Continuation of Ser. No. 33,519, Apr. 26, 1979, abandoned. This application Jul. 9, 1980, Ser. No. 167,144
Claims priority, application Finland, Apr. 27, 1978, 781311
Int. Cl.[3] B01D *35/00*
U.S. Cl. 210—120 1 Claim



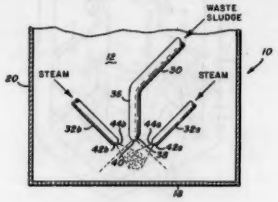
1. A water filtering apparatus, which comprises:
(a) a pressure tank having an inlet port for water having impurities and outlet port for filtered water;
(b) a water pump attached on the inlet side of said tank for pressurized water;
(c) a check valve mounted at bottom of the pressure tank to prevent a flow of air and water to the pump;
(d) a three-way valve mounted securely inside the tank such that a neck body of the valve is being engaged with a water gauge attachment aperture inside the tank and said three-way valve is in communication with the check valve;
(e) a filter cartridge frame assembled of tees and crosspipes having end rubber cones which engage securely with the intake and outlet ports of the tank below the filter cartridge frame, said engagement is being secured with a tightening member at each of said rubber cones.
(f) a draining valve mounted into the bottom of the tank;
(g) a sludge cylinder made of hard plastic fitted upon a bottom grating of the tank and said cylinder is being positioned in a central part of the tank in communication with the draining valve to promote the running to the draining valve of such precipitate that has accumulated in retrograde flushing;
(h) a plurality of bags having an alkaline mass placed around the sludge cylinder and said bags ascending from the cylinder to walls of the tank for alkalisation of the water to be filtered; and
(i) a venting valve mounted at the top of the tank for admitting air to activate the water flow inside the tank.

4,317,722
WASTE SOLVENT RECOVERY APPARATUS

Stepan Majicek, and Frank A. Fitz, both of San Jose, Calif., assignors to Verbatim Corporation, Sunnyvale, Calif.

Filed Jan. 14, 1980, Ser. No. 112,113
Int. Cl.[3] C02C *1/36*
U.S. Cl. 210—149 10 Claims

1. A waste solvent recovery apparatus comprising:
a container having generally vertical side walls with an exit port for removal of solvent located generally near the top of said container;
means for delivering a stream of sludge containing a concentration of a selected organic solvent into the container at a sludge entrance port displaced from said exit port;
a gaseous material having a boiling point higher than that of said selected solvent and for flowing through the container;
means for heating the gaseous material to a temperature greater than the boiling point of said selected solvent;
means for directing said heated gaseous material into said stream of sludge as said stream is delivered to the container;
means for measuring the temperature at locations within the container near the top and near the bottom; and

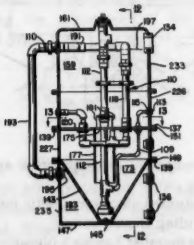


means for maintaining the operating temperature within the container such that the temperature within the container is greater than the boiling point of said selected solvent, and the temperature near the bottom of the container is higher than the boiling point of the gaseous material while the temperature in the vicinity of said exit port is lower than the boiling point of the gaseous material.

4,317,723
SEWAGE TREATMENT

Walter W. Rapp, and Gary A. Crosby, both of New Iberia, La., assignors to Red Fox Industries Inc., New Iberia, La.

Continuation-in-part of Ser. No. 95,107, Nov. 16, 1979, Pat. No. 4,268,389. This application May 19, 1980, Ser. No. 151,405
Int. Cl.[3] C02F *3/20, 3/22*
U.S. Cl. 210—202 8 Claims



1. A sewage treatment device arranged in
a vertical stack of cylindrical components comprising uppermost an aeration chamber,
a clarification chamber beneath said aeration chamber in communication therewith,
a clarifier discharge chamber beneath said aeration and clarification chambers,
a chlorine contact discharge chamber connected to said clarifier discharge chamber,
means communicating said clarification chamber with said clarifier discharge chamber, and
anti-siphon vent means in said means communicating said clarification chamber with said clarifier discharge chamber and lying substantially in the geometric center of said aeration chamber.

8. A sewage treater comprising an aerator, a clarifier and a disinfector,
said clarifier being disposed beneath said aerator and the top

of the clarifier with a common wall therebetween forming the bottom of the aerator,

first passage means to conduct fluid from the aerator to the clarifier,

said first passage means comprising a central port in said common wall,

and second passage means to conduct fluid from the clarifier to disinfector, said aerator having an influent inlet, said disinfector having an effluent outlet, said treater being distinguished in that said aerator includes a vessel and nozzle means for admitting air to the vessel in a direction to cause fluid in the vessel to move orbitally about a vertical axis,

said nozzle means being disposed at a level proximate the common wall between said aerator and clarifier, and

anti-siphon vent means in said second passage means and lying substantially in the geometric center of said aeration chamber.

4,317,724

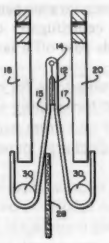
FEEDING DEVICE FOR USE IN FILTER PRESSES

Donald E. Bardsley, Nashua, N.H., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed May 23, 1980, Ser. No. 152,749

Int. Cl.³ B01D *25/32*

U.S. Cl. 210—225 **5 Claims**



1. In a filter press for filtering liquids, the press comprising filter means consisting of separable filter plates forming filter chambers, filter media, and diaphragms for removing liquid to form filter cakes and displacing the filter cakes from the chambers when the filter plates are displaced to an open position, the improvement comprising: inlet means conducting liquid to the upper portion of said filter chamber being constructed and arranged with an elastically-deformable material that is compressed under fluid pressure as cake builds in the chamber, whereby as the filter plates are opened the elastic material comprising the inlet returns to its original shape dislodging material tending to adhere to the inlet conduit, otherwise causing it to clog, making the filter press inoperative.

4,317,725

PORTABLE ARTIFICIAL KIDNEY WITH SEPARABLE PARTS

Tadashi Kume, Tokyo; Yoshitsugu Fujimori, Tokorozawa, and Isamu Inoh, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 13, 1979, Ser. No. 47,998

Claims priority, application Japan, Jun. 15, 1978, 53/71526; Jun. 15, 1978, 53/71527

Int. Cl.³ B01D *31/00*

U.S. Cl. 210—235 **5 Claims**

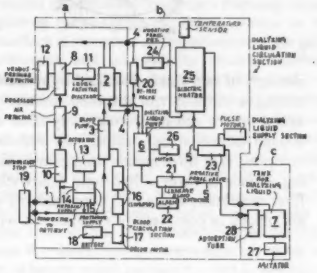
1. In an artificial kidney apparatus of the type including a blood circulation section comprising a blood circuit connectable with blood vessels of a patient, a dialyser and a blood pump interposed in said blood circuit, drive motor means for the blood pump, and electrical supply means for said motor means, and, a dialyzing liquid circulation section comprising a dialyzing liquid circuit, a dialyzing liquid pump, and drive motor means for the dialyzing liquid pump, the improvement comprising:

a first casing containing said blood circulation section inclusive of said blood circuit, said dialyser, said blood pump, said motor means, and said electrical supply means to form an integral portable unit;

a second casing from which said first casing is readily detachable and which contains said dialyzing liquid circulation unit; and

means for operatively coupling and uncoupling said portable unit with said dialyzing liquid circulation unit to automatically connect and disconnect said blood circulation section and said dialyzing liquid circulation section;

said means for operatively coupling and uncoupling said portable unit with said dialyzing liquid circulation unit including valve means for connecting the dialyzer of said



blood circulation section to said dialyzing liquid circuit when said units are coupled together and for disconnecting said dialyser from said dialyzing liquid circuit when said units are uncoupled;

said valve means comprising first normally closed valve elements located in said portable unit, and second normally closed valve elements located in said dialyzing liquid circulation unit, said first and second valve elements including cooperating parts to open said valve elements when said units are coupled together;

said blood circulation unit being provided with openings in which said first valve elements are mounted, and said dialyzing liquid circulation unit having openings in which said second valve elements are mounted, said openings being placed in communication with one another with said valve elements opened when said units are coupled together.

4,317,726

MICROBIAL FILTER ASSEMBLY

Michael Shepel, Frederick, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 12, 1981, Ser. No. 233,758

Int. Cl.³ B01D *25/02*

U.S. Cl. 210—236 **19 Claims**

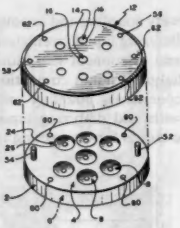
1. A filter assembly for use with a filter membrane to detect small numbers of microbial agents which comprises:

a filter base comprising a first broad filter supporting surface for receiving said filter membrane, a second broad filter draining surface disposed in parallel relation therebelow, and at least one filter support and drain assembly extending transversely therebetween to place said filter supporting surface and said filter draining surface in fluid registry with each other;

at least one cover plate disposable over said filter supporting surface having at least one fluid inlet port for receiving a quantity of a fluid containing said microbial agents provided in axial alignment and equal number to said support

and drain assemblies, each fluid inlet port defining an internal diameter that decreases in the direction of said filter membrane, said internal port terminating in an apical orifice located proximate to said filter membrane when said cover plate is disposed thereover; and

means for forming a fluid-tight seal about a portion of the surface area of said filter membrane to limit the flow



through of said fluid, said fluid-tight sealing means comprising a circular rim disposed annularly adjacent said apical orifice and projecting away from said cover plate coaxial to said apical orifice, said circular rim acting to compress said filter membrane against said filter supporting surface to form a fluid-tight sandwiching seal in said filter membrane when said filter base and said cover plate are placed in compressive engagement with each other.

4,317,727

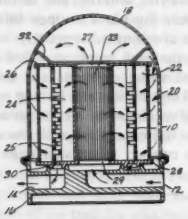
FLUID FILTER CARTRIDGE AND METHOD OF ITS CONSTRUCTION

Paul J. Meissner, Sun Valley, Calif., assignor to Meissner Manufacturing Company, Inc., Sun Valley, Calif.

Filed Jun. 18, 1980, Ser. No. 160,906

Int. Cl.³ B01D *27/06*

U.S. Cl. 210—315 **12 Claims**



1. A fluid filter assembly comprising:

a housing having an inlet and an outlet;

a filter cartridge including inner and outer annular elements disposed in the housing, the inner surface of the inner element and the outer surface of the outer element being in communication with the inlet, at least one of the elements comprising a pleated filter, the inner and outer elements being separated to define therebetween an annular region communicating with the outlet; and

the improvement characterized by a single-ply tubular insert disposed in the annular region between the inner and outer elements, the insert having a side wall, perforations formed in the side wall to permit transverse flow through the insert from the pleated filter to the annular region, and protrusions extending transversely from the side wall to permit longitudinal flow through the annular region, the side wall and the protrusions together forming a spacer between the elements.

4,317,728

WOBBLE CENTRIFUGE

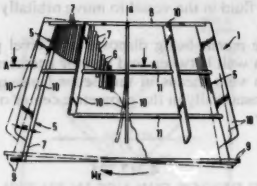
Helmut Wilkesmann, Munich, Fed. Rep. of Germany, assignor to Krauss-Maffei Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 24, 1980, Ser. No. 132,771

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1979, 2912368

Int. Cl.³ B01D *33/02*

U.S. Cl. 210—370 **5 Claims**



1. A wobble centrifuge comprising:

a frustoconical drum having a sieve surface made up of individual spaced-apart rods defining slot-like gaps between them and surrounding a drum axis, said rods being affixed to flanges at opposite axial end of the drum and being adapted to receive a suspension of solids in a liquid whereby liquid is centrifugally discharged through said slots and said solids pass off a large diameter end of said drum;

means connected to said drum for rotating said drum about said drum axis and for orbiting said drum axis about another axis whereby said drum undergoes a wobble movement to impart a discharge pulse to solids passing from said drum; and

means for imparting relative movement to said rods of said drum whereby the relative movement of said rods dislodges solids tending to collect in said gaps, said means for imparting relative movement to said rods including a support structure surrounding said rods and connected to said drum capable of undergoing elastic deformation, wobbling of said drum applying a gyratory moment to said dstructure inducing deformation of said drum and the relative movement of said rods, said support structure comprising a plurality of angularly equispaced bars extending along generatrices of said drum and affixed to one of said flanges but unconnected to the other flange, and a plurality of axially spaced rings surrounding said rods and secured to said bars.

4,317,729

ETHYLENE-VINYL ALCOHOL COPOLYMER HOLLOW FIBER MEMBRANES AND METHOD OF PRODUCING SAME

Shuzo Yamashita; Taku Tanaka; Hirokuni Tanii, all of Kurashiki; Akira Kubotsu, Soja, and Syuji Kawai, Kurashiki, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Apr. 21, 1980, Ser. No. 142,227

Claims priority, application Japan, Apr. 27, 1979, 54-53031

Int. Cl.³ B29D *27/04;* **D02G** *3/00*

U.S. Cl. 210—500.2 **7 Claims**

1. An ethylene-vinyl alcohol hollow fiber membrane which is characterized in that, when observed in the dry state with an electron microscope, the hollow fiber membrane exhibits an annular cross section having an outer surface and an inner surface, at least one surface having a dense, active skin layer, said outer and inner surfaces separated by a three-layered structure comprising two opposed layers respectively contact-

ing said outer and inner surfaces, said layers each consisting of a plurality of particles bonded together and having particle

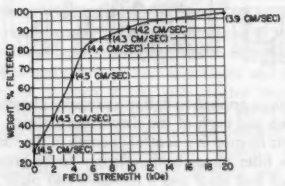
sizes ranging from 0.01 to 2 microns, and a substantially particle-free homogeneous layer disposed therebetween.

4,317,730

PURIFICATION OF AQUEOUS LIQUIDS USED IN MANGANESE NODULE PROCESSING

Gale L. Hubred, Richmond, and Robert T. Lewis, Albany, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Sep. 10, 1980, Ser. No. 183,111
Int. Cl.³ B01D *43/00*
U.S. Cl. 210—695 **6 Claims**



1. A method for removing essentially all finely divided solids, including both diamagnetic and paramagnetic materials, from an aqueous liquid previously employed in processing manganese nodules, comprising:

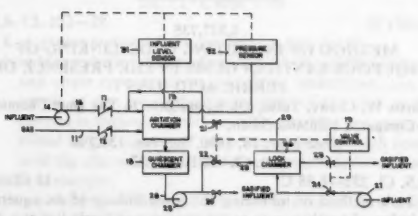
passing said liquid through a ferromagnetic matrix maintained in a magnetic field having an average strength of at least 2 kiloOersteds.

4,317,731

GAS ABSORBER

Thomas E. Roberts, Jr., Saratoga; John A. Abbott, San Mateo, and Bruce M. Wright, San Jose, all of Calif., assignors to FMC Corporation, Chicago, Ill.

Filed Mar. 27, 1978, Ser. No. 890,727
Int. Cl.³ C02F *1/74*; B01F *3/04*
U.S. Cl. 210—741 **16 Claims**



1. A method of dissolving high concentrations of a gas into a liquid within a chamber, comprising the steps of pressurizing the chamber, injecting the gas and liquid into the upper part of the chamber, agitating the gas and liquid mixture in the upper part of the chamber to obtain an increased gas concentration subsaturated solution at the chamber pressure, isolating the gas and liquid mixture in the lower part of the chamber from the agitation in the upper part of the chamber while allowing flow of the subsaturated solution into the lower part of the chamber, holding the solution in the lower part of the chamber so that the increased gas concentration subsaturated solution becomes substantially quiescent therein, whereby large gas bubbles disengage from the subsaturated solution in the lower part of the chamber and rise to the upper part of the chamber and small gas bubbles dissolve in the subsaturated solution in the lower part of the chamber, and withdrawing the solution from the lower part of the chamber after substantially all of the large bubbles have disengaged and the small bubbles have dissolved.

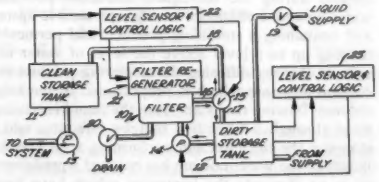
9. In an absorber for gasifying a liquid wherein the liquid and a gas are introduced together under pressure into a vessel defining a first sealed chamber having means disposed therein for violently agitating the resulting gas-liquid mixture so that the liquid-gas interface is increased and dissolution of the gas in the liquid is enhanced, and wherein the absorber includes means for discharging the gasified liquid from the vessel, the improvement comprising a separate pressure vessel defining a second sealed chamber, a conduit extending between the vessel defining the first sealed chamber and said separate pressure vessel, for communicating said first and second sealed chambers and for conducting the gas and the liquid freely therebetween, said second sealed chamber being disposed to receive the gas-liquid mixture through said conduit and to hold the gas-liquid mixture therewithin for a predetermined period of time, said means for discharging communicating with said second chamber, whereby small gas bubbles within said second sealed chamber are dissolved in the liquid therein within said predetermined period of time and large bubbles are disengaged from the liquid and returned through said conduit to said first sealed chamber.

4,317,732

LIQUID RECONDITIONING SYSTEM

William A. Shoquist, Hopkins, Minn., assignor to Andrew Engineering, Inc., Minnetonka, Minn.

Filed Sep. 8, 1980, Ser. No. 185,157
Int. Cl.³ B01D *37/02, 29/38*
U.S. Cl. 210—744 **6 Claims**



1. In a liquid reconditioning system of the type having first storage means for storing reconditioned liquid, having means for withdrawing reconditioned liquid from said first storage means for use as required, having second storage means for storing used liquid to be reconditioned and having means interconnecting said first and second storage means for transferring liquid from said second storage means to said first storage means whle filtering particulate material therefrom, said interconnecting means including filter means having septum means for supporting diatomite and valve means connected to the output of said filter means, the improvement for automatically regenerating said filter which comprises means for detecting a condition representative of filter means blinding and means responsive to said detecting means for vertically moving said septum means within said filter means while said valve means closes said filter means output, said valve means sequentially connecting said filter means output to said second

storage means, for a predetermined period, and said first storage means following septum means movement.

4,317,733

WATER PURIFICATION EQUIPMENT

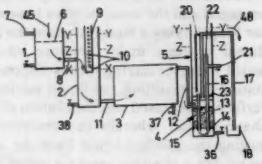
Gilberte M. J. Xhonneux, Sint-Pieters-Woluwé, 1150 Brussels, Belgium

Filed Dec. 11, 1979, Ser. No. 102,343

Claims priority, application Netherlands, Dec. 15, 1978, 7812211

Int. Cl.[3] C02F *1/50, 1/76*

U.S. Cl. 210—752 27 Claims



1. Water purification equipment comprising: a filtering compartment containing a filtering medium, said filtering compartment having an inlet for unfiltered water and an outlet for filtered water; a liquid-receiving compartment connected to the inlet to the filtering compartment and having an inlet for the liquid to be purified, located above the level of the inlet to the filtering compartment so that the liquid level in the liquid-receiving compartment varies in proportion to the head loss within the filtering medium and to the liquid flow rate in said receiving compartment; and a container having an upstanding water-permeable wall extending in the liquid-receiving compartment up to a level above the level of the filtered water outlet and in the liquid flow through said liquid-receiving compartment, said container containing a sterilizing product which diffuses into the liquid present in the liquid-receiving compartment at a rate proportional to the liquid level in said liquid-receiving compartment.

25. A process for purifying a water flow by sterilization and filtration which comprises: withholding, prior to filtration, the water flow in a liquid receiving compartment so as to form a water column of which the height is a function of the head loss created during the subsequent filtration; providing in said water column a container having a permeable upstanding wall and containing a sterilizing product, said permeable wall extending up to a level above the level of water in the water column thereby diffusing the sterilizing product in the water column at a rate which is proportional to the height of said column; flowing the water from the liquid receiving compartment through a filter bed thereby effecting said head loss; stopping the filtration and performing a backwash when the height of the water column has reached a predetermined level so as to eliminate the impurities which have been retained during the filtration and to bring again the head loss created during filtration to an initial level; and starting again the filtration.

4,317,734

FILTRATION-COMPRESSION TYPE FILTER PRESS

Tetsuya Kurita, 1-11-22, Yamamoto-Higashi, Takarazuka, Japan

Continuation of Ser. No. 964,165, Nov. 28, 1978, Pat. No. 4,237,009, which is a continuation-in-part of Ser. No. 857,757, Dec. 5, 1977, abandoned. This application Apr. 4, 1980, Ser. No. 137,265

Int. Cl.[3] B01D *25/12*

U.S. Cl. 210—780 4 Claims

1. A method for forced discharge of filtrate in a filtration-compression type filter press comprising

stopping slurry feed after slurry is fed under pressure from a slurry feed inlet to a filtration chamber and filtered by a filter cloth piece and uneven filter surface,

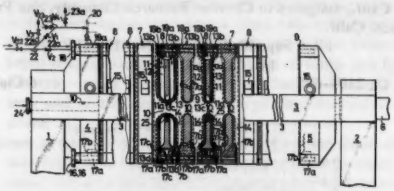
feeding pressure fluid under pressure from a pressure fluid feed line to a pressure chamber of a compression filter plate,

compressing cake in the filtration chamber by expanding flexible fluid-tight sheets and discharging filtrate remaining in the cake,

directing pressure fluid in the pressure chamber backward to a dual-purpose feed channel of the compression filter plate through a branch line and a washing liquid feed line by closing a valve in the upper stream of the pressure fluid feed line alone and opening a valve of the branch line to direct it to a space between the filter cloth piece and the uneven filter surface of the sheet of the compression filter plate, whereby

filtrate remaining in the filtrate groove of the uneven filter surface of the compression filter plate is forcibly discharged together with liquid contained in the cake through a filtrate outlet channel by passing the filtrate through the filter cloth piece.

2. In a filtration-compression type filter press including compression filter plates each comprising a base plate and two flexible fluid-tight sheets fitted to the front and rear surfaces of the base plate respectively and having uneven surfaces with a



filter cloth piece applied to define a pressure chamber between the base plate and each of the sheets and a slurry path of the flexible sheets formed in a central opening of the base plate, the compression filter plates being adapted to be pressurized between a fixed end plate and a movable end plate to define a filtration chamber in each space between the end plates, and the compression filter plate, and the fixed end plate being provided with a slurry feed inlet opened to the slurry path of the compression filter plate and a filtrate outlet port communicating with a filtrate outlet channel of the compression filter plate, an apparatus for forced discharge of filtrate comprising,

a pressure fluid feed line communicating with a pressure fluid feed channel open to the pressure chamber of the compression filter plate connected to a pressure fluid feed port of the fixed end plate,

a branch line communicating with a dual-purpose feed channel which is open to the uneven filter surface of said sheet of the compression filter plate and communicates with a space between said sheet and said filter cloth piece is bifurcated from the pressure fluid feed line, and

a valve provided upstream of the bifurcation point of the branch line of the pressure fluid feed line and a valve provided downstream thereof.

4,317,735

METHOD OF INHIBITING CROSSLINKING OF AQUEOUS XANTHAN GUMS IN THE PRESENCE OF FERRIC ACID IONS

Curtis W. Crowe, Tulsa, Okla., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 18, 1980, Ser. No. 131,296

Int. Cl.[3] E21B *43/27*

U.S. Cl. 252—8.55 C 13 Claims

1. A method of inhibiting the cross-linking of an aqueous solution of xanthan gum in the presence of ferric ion at a pH above about 1.3 comprising adding to an aqueous solution of non-crosslinked xanthan gum, at a pH less than about 1.5, ascorbic acid and/or erythorbic acid, and/or a soluble salt of

said acid in an amount sufficient to inhibit or prevent the cross-linking of the xanthan gum in the presence of ferric ion.

4,317,736

SOIL RESISTANT YARN FINISH FOR SYNTHETIC ORGANIC POLYMER YARN

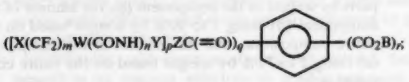
Robert M. Marshall, Chester, Va., assignor to Allied Chemical Corporation, Morris County, N.J.

Filed Nov. 28, 1980, Ser. No. 210,995
Int. Cl.³ D06M *13/34*
U.S. Cl. 252—8.75 68 Claims

1. A yarn finish composition comprising:

a. about 15 to 80 weight percent of a solution of a salt of dioctyl sulfosuccinate, propylene glycol and water;

b. about 20 to 85 weight percent of a fluorochemical compound having the formula:



wherein the attachment of the fluorinated radicals and the radicals CO_2B to the nucleus is in asymmetrical positions with respect to rotation about the axis through the center of the nucleus; wherein "X" is fluorine, or perfluoroalkoxy of 1 to 6 carbon atoms, and m has arithmetic mean between 2 and 20; n is zero or unity; "W" and "Y" are alkylene, cycloalkylene or alkyleneoxy radicals of combined chain length from 2 to 20 atoms; $(CF_2)_m$ and "Y" have each at least 2 carbon atoms in the main chain, "Z" is oxygen and p is 1, or "Z" is nitrogen and p is 2; q is an integer of at least 2 but not greater than 5; "B" is CH_2RCHOH or is $CH_2RCHOCH_2RCHOH$ where "R" is hydrogen or methyl, or "B" is $CH_2CH(OH)CH_2Q$ where Q is halogen, hydroxy, or nitrile; or "B" is $CH_2CH(OH)CH_2OCH_2CH(OH)CH_2Q$; and r is an integer of at least 1 but not greater than q; and $X(CF_2)_m$, W and Y are stright chains, branched chains or cyclic; and wherein the substituent chains of the above general formulas are the same or different; and

c. an effective amount of a dispersant selected from the group consisting of a salt of a polycarboxylic acid, a salt of a sulfonated naphthalene-formaldehyde condensate, and a salt of an alkyl naphthalene sulfonate.

4,317,737

POLYOLEFIN BASED GREASES GELLED BY CLAYS OVERTREATED BY HIGHER DIALKYL DIMETHYL AMMONIUM SALTS

Alexis A. Oswald, Mountainside; Gary L. Harting, Westfield, and Harry W. Barnum, Brookside, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Mar. 23, 1977, Ser. No. 780,451
Int. Cl.³ C10M *3/44*
U.S. Cl. 252—28 15 Claims

1. A grease composition comprising a mixture of

(a) a higher dialkyl dimethyl ammonium clay gellant of layer and chain type structure containing ammonium ions in excess of the ion exchange capacity of the clay as expressed in milliequivalents per 100 g dry clay and as determined by the amount of ammonium acetate which reacts with the clay when an excess of ammonium acetate is used as a reactant,

(b) a polyolefin of aliphatic character as a base fluid wherein said gellant and base fluid are employed in sufficient amounts to provide desired viscosity behavior in said grease.

4,317,738

DISPERSANTS AND DISPERSANT VISCOSITY MODIFIERS FROM OXIDIZED-SULFURIZED OLEFINS

J. Ronald Spence, Bartlesville, Okla., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Oct. 10, 1980, Ser. No. 196,051
Int. Cl.³ C10M *1/38*
U.S. Cl. 252—47.5 17 Claims

1. An improved dispersant having an improved color and resistance to formation of engine deposits which comprises the reaction product of an olefin having a molecular weight of 2500–100,000, an oxidizing agent capable of releasing oxygen atoms or molecules under oxidizing conditions such that the molecular weight of the olefin is not reduced substantially below 2500, about 0.1 to 20 moles of sulfur or a sulfur-yielding compound per mole of olefin and about 0.5 to 10 moles of a polyamine per mole of olefin, at a temperature between about 50° to 500° C.

9. An improved dispersant having improved color and resistance to engine deposit formation which comprises the product of the reaction of contacting an olefin having a molecular weight of 2500–100,000 with an oxidizing agent capable of releasing oxygen atoms or molecules under oxidizing conditions such that the molecular weight of the olefin is not reduced substantially below 2500, to form an oxidized intermediate, contacting the oxidized intermediate with about 0.1 to 20 moles of sulfur or a sulfur-yielding compound to form an oxidized sulfurized product, and contacting the oxidized sulfurized product with about 0.5 to 10 moles of a polyamine per mole of olefin, at a temperature of about 50° to 500° C.

17. A lubricant composition comprising a major proportion of a lubricating base oil and about 0.1 to 10 weight percent based on the oil of the product of claim 1 or 9.

4,317,739

AMINATED SULFURIZED OLEFIN FUNTIONALIZED WITH A BORON COMPOUND AND FORMALDEHYDE

J. Ronald Spence, Bartlesville, Okla., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Oct. 10, 1980, Ser. No. 196,029
Int. Cl.³ C10M *1/38*
U.S. Cl. 252—47.5 7 Claims

1. An improved sulfurized aminated olefin dispersant composition substantially noncorrosive to engine surfaces which comprises the product of the reaction of:

(a) an olefin having about 10 to 10,000 carbon atoms and 0.1 to 20.0 moles of a sulfur or a sulfur-yielding compound per mole of olefin to form a sulfurized olefin at about 50° to 500° C.,

(b) reacting the sulfurized olefin with about 0.1 to 20 moles of a polyamine per mole of olefin, having the formula:

$$H_2N[(CH_2)_zNH]_xH$$

wherein z is an integer of 2 to 6 and x is an integer of 1 to 10 to form an aminated sulfurized olefin, at about 50° to 400° C., and

(c) reacting the aminated sulfurized olefin with about 0.1 to 10 moles of a boron compound, comprising a boric acid, a boric acid salt or a boron oxide, and about 0.1 to 10 moles of formaldehyde or a formaldehyde-yielding compound each per mole of olefin at about 50° to 300° C.

7. A lubricating oil which comprises a major amount of a lubricating base oil and about 0.01 to 20 percent by weight based on the oil of the product of claim 1.

4,317,740
WATER-SOLUBLE POLYESTERS

Wilmer C. Eisenhard, Savannah, Ga., assignor to Union Camp Corporation, Wayne, N.J.

Filed Apr. 22, 1980, Ser. No. 142,647
Int. Cl.³ C10M *3/04, 3/20*
U.S. Cl. 252—49.3 **6 Claims**

1. A water-soluble polyester which comprises; the condensation product of

(a) a polyoxyalkylene glycol having a molecular weight of from about 400 to about 1000; and

(b) the addition product of

(1) a dimer fatty acid; and

(2) from about 0.4 to about 0.8 equivalents of maleic anhydride for each equivalent of the dimer fatty acid wherein about 2.1 to about 3.2 equivalents of the glycol are used for each equivalent of the addition product.

5. From about 0.1 to 25.0 percent by weight of the polyester of claim **1** in aqueous solution.

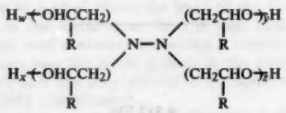
4,317,741
USE OF POLY(OXYALKYLATED) HYDRAZINES AS CORROSION INHIBITORS

Henry F. Lederle, North Haven, and Frank J. Milnes, Guilford, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Jan. 29, 1981, Ser. No. 229,368
Int. Cl.³ C09K *5/02;* **C10M** *3/26*
U.S. Cl. 252—77 **14 Claims**

1. In a hydraulic fluid composition comprising at least one base fluid, at least one diluent fluid and an inhibitor portion; the improvement which comprises:

said inhibitor portion comprising an effective corrosion-inhibiting amount of a poly(oxyalkylated) hydrazine having the formula:



wherein each R is individually selected from hydrogen, lower alkyl groups having from 1 to 4 carbon atoms and phenyl; and the sum of w, x, y, and z is from about 4 to about 20.

4,317,742
OXYGEN SCAVENGER COMPOSITION, HEAT-GENERATING COMPOSITION AND HEAT-GENERATING STRUCTURE

Teizo Yamaji, Yamaguchi, and Eishin Yoshisato, Iwakuni, both of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Feb. 23, 1979, Ser. No. 14,640
Claims priority, application Japan, Feb. 24, 1978, 53-19911; Mar. 8, 1978, 53-25473; Jun. 9, 1978, 53-68926; Jul. 24, 1978, 53-89365; Jul. 24, 1978, 53-89366; Jul. 24, 1978, 53-89367
Int. Cl.³ C09K *5/00*
U.S. Cl. 252—188 **15 Claims**

1. An oxygen scavenger composition consisting essentially of

(I) as essential components,

(a) an alkali metal sulfide expressed by the following formula (1)

$$M_2S_x \quad (1)$$

wherein M represents an alkali metal, and x is a positive number of 1 to 10,

(b) at least one oxidation promoter selected from the group consisting of silica, alumina, silica-alumina, silica-magnesia and a naturally occuring or synthetic material containing at least 50% by weight of one of silica, alumina, silica-alumina or silica-magnesia as a main ingredient; and

(II) as optional components,

(c) at least one oxidation promoter aid selected from the group consisting of copper, cerium, tin, lead, chromium, selenium, tellurium, manganese, rhenium, iron, cobalt, nickel, ruthenium, rhodium, palladium, osmium, iridium, and platinum, and compounds of these metals, and/or

(d) a water-insoluble or sparingly water-soluble, inert filler, and/or

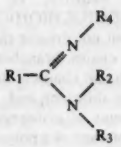
(e) water in a hydrous or hydrated condition and the amount of the component (a) being 5 to 90% by weight based on the entire composition, the amount of the component (b) or both the component (b) and the component (c) being at least 10 parts by weight per 90 parts by weight of the component (a), the amount of the component (c) being 1 to 100 parts by weight per 100 parts by weight of the component (b), the amount of the component (d) being 1 to 90% by weight based on the entire composition, and the amount of the component (e) being 2 to 75% by weight based on the entire composition.

4,317,743
PROCESS FOR MAKING MICROCAPSULES AND RESULTING PRODUCT

John C. H. Chang, Naperville, Ill., assignor to Wallace Business Forms, Inc., Hillside, Ill.

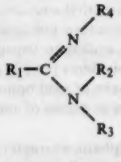
Filed Dec. 5, 1979, Ser. No. 100,638
Int. Cl.³ B01J *13/02*
U.S. Cl. 252—316 **17 Claims**

1. A process for making microcapsules comprising: dissolving an isocyanatoamidine product in a hydrophobic liquid, said isocyanatoamidine product comprising the reaction product of (A) an isocyanatoamidine having the formula



wherein R_1 is a member selected from the group consisting of hydrogen and a lower alkyl group, R_2 and R_3 are members selected from the group consisting of lower alkyl groups, and R_4 is a member selected from the group consisting of an isocyanatoaryl group, an isocyanatoalkyl group and an isocyanatocycloalkyl group and (B) an isocyanate, and thereafter introducing the solution thus achieved into an aqueous emulsifier under conditions promotive of hydrolysis of said product to produce an impermeable capsule wall surrounding hydrophobic liquid.

17. Microcapsules having impermeable walls consisting essentially of the hydrolyzed reaction product of (A) an isocyanatocycloalkyl having the formula



wherein R_1 is a member selected from the group consisting of hydrogen and a lower alkyl group, R_2 and R_3 are members selected from the group consisting of lower alkyl groups, and

R_4 is a member selected from the group consisting of an isocyanatoaryl group, an isocyanatoalkyl group and an isocyanatocylcoalkyl group and (B) an isocyanate.

4,317,744

CORROSION INHIBITOR

Elliott J. Levi, Kinnelon, N.J., assignor to Drew Chemical Corporation, Boonton, N.J.

Filed Apr. 25, 1979, Ser. No. 33,122
Int. Cl.[3] C09K *3/00*
U.S. Cl. 252—389 A 15 Claims

1. A corrosion inhibiting composition, consisting essentially of:

(a) at least one water soluble phosphonic acid or water soluble salt thereof;

(b) at least one member selected from the group consisting of water soluble acrylic acid polymers, water soluble methacrylic acid polymers and water soluble polymers of maleic acid or its anhydride; and

(c) tolyltriazole, said components (a), (b) and (c), being present in an amount effective to inhibit corrosion in aqueous systems, and wherein the composition includes from 65 to 80% of (a), from 5% to 20% of (b) and from 15% to 25% of (c), based on the three components, all by weight.

4,317,745

CATALYTIC OXIDATION OF PHENOLS TO 1,4-BENZOQUINONES

Hsin H. Hsieh, Baton Rouge, La., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 15, 1980, Ser. No. 216,107
Int. Cl.[3] C07C *49/66*
U.S. Cl. 252—428 7 Claims

1. A heterogeneous catalyst for the oxidation of phenol and substituted phenols to the corresponding 1,4-benzoquinones in the gas phase, the composition of the catalyst comprising a mixture of vanadium pentoxide or ammonium metavanadate, an ammonium or alkali-metal sulfate, an ammonium or alkali-metal pyrosulfate, ferrous or ferric sulfate, boric acid, and silica.

4,317,746

HYDROTREATING CATALYSTS

Ryden L. Richardson, Whittier, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Nov. 28, 1980, Ser. No. 211,110
Int. Cl.[3] B01J *27/18*
U.S. Cl. 252—435 12 Claims

1. A catalyst composition active when sulfided for hydrodenitrogenation or hydrodesulfurization comprising nickel, molybdenum, and phosphorus components in combination on a porous refractory oxide support comprising gamma alumina, said catalyst composition having been prepared by a method including the steps of:

(1) partially hydrating porous support particles comprising gamma alumina by contacting said particles with a gas comprising at least about 15 vol.% water vapor at a partial pressure of at least about 2 p.s.i.a. while said support particles are in motion;

(2) subsequently impregnating the partially hydrated support particles with dissolved nickel, molybdenum, and phosphorus components; and

(3) calcining the resulting composite at an elevated temperature in the presence of oxygen.

4,317,747

PROMOTED U-SB-OXIDE CATALYSTS

Dev D. Suresh, Macedonia, and Robert K. Grasselli, Chagrin Falls, both of Ohio, assignors to The Standard Oil Co., Cleveland, Ohio

Filed Nov. 16, 1979, Ser. No. 95,886
Int. Cl.[3] B01J *23/12, 23/18, 23/20, 23/24*
U.S. Cl. 252—469 15 Claims

1. A tin free uranium antimonate oxide complex catalyst of the formula:

$$A_aB_bE_cU_dSb_eO_x$$

wherein

A is at least one element selected from Group IB and Group VB of the Periodic Table;

B is at least one element selected from Group VIB;

E is at least one element selected from Group IVA and thorium; and

wherein

a is 0.001 to 10;

b is 0.001 to 10;

c is 0.001 to 10;

d is 0.1 to 10;

e is 1 to 20;

x is determined by the valence requirements of the other elements present, the U/Sb ratio in said catalyst being 1/10 to 1/1.

4,317,748

PROCESS FOR THE PREPARATION OF SUPPORTED NICKEL CATALYSTS

John Torok, Deep River; Eugene F. McCaffrey, Mississauga; Roland H. Riem, Oakville, and Wing S. Cheung, Toronto, all of Canada, assignors to Emery Industries, Inc., Cincinnati, Ohio

Filed Oct. 24, 1980, Ser. No. 200,181
Claims priority, application Canada, Dec. 12, 1979, 341686
Int. Cl.[3] B01J *23/74*
U.S. Cl. 252—472 8 Claims

1. A process for the preparation of improved supported nickel catalysts comprising:

(a) contacting a nickel soap of an aliphatic monocarboxylic acid having from 2 to 22 carbon atoms with an inorganic support having a surface area greater than 50 m^2/g at a temperature from 0° C. to 250° C. in an inert aliphatic hydrocarbon diluent having a boiling point greater than 90° C. to obtain a nickel-bearing support;

(b) sulfiding the resulting nickel-bearing support to convert at least 1% of the nickel associated therewith to nickel sulfide; and

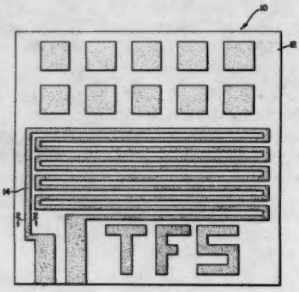
(c) reducing in the presence of additional nickel soap.

4,317,749

THICK FILM CONDUCTOR EMPLOYING COBALT OXIDE

Jason D. Provance, and Kevin W. Allison, both of Santa Barbara, Calif., assignors to Ferro Corporation, Cleveland, Ohio

Filed Aug. 22, 1980, Ser. No. 180,299
Int. Cl.³ H01B 1/06
U.S. Cl. 252—519 19 Claims



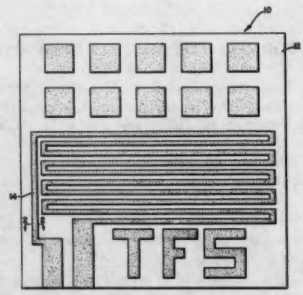
1. A thick film conductor paste of:
A. 10 to 30 weight percent boron; and
B. zero to 35 weight percent glass frit; and
C. balance essentially cobalt oxide,
wherein all weight percentages are on a dry basis.

4,317,750

THICK FILM CONDUCTOR EMPLOYING NICKEL OXIDE

Jason D. Provance, and Kevin W. Allison, both of Santa Barbara, Calif., assignors to Ferro Corporation, Cleveland, Ohio

Filed Aug. 22, 1980, Ser. No. 180,446
Int. Cl.³ H01B 1/06
U.S. Cl. 252—519 17 Claims



1. A thick film conductor paste of:
A. 12 to 25 weight percent boron; and
B. zero to 35 weight percent glass frit; and
C. balance essentially nickel oxide
wherein the combined weight of boron and glass frit is between 22 and 45 weight percent of the paste; wherein all weight percentages are on a dry basis.

4,317,751

THALLIUM DOPED POTASSIUM IODIDE FILTER

Robert J. Kraushaar, Tenafly, N.J., and Kevin B. Ward, Bayside, N.Y., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jun. 26, 1980, Ser. No. 163,375
Int. Cl.³ F21V 9/12; G02B 5/20
U.S. Cl. 252—582 14 Claims

1. An optical filter comprising a first filter element including thallium doped potassium iodide and a second filter element including 2,7-dimethyl-diaza-(3,6)-cycloheptadien-(1,6)-perchlorate.

9. A method of filtering light to selectively transmit ultraviolet, which comprises: inserting in the path of said light a filter including a thallium doped potassium iodide filter element and another filter element including 2,7 dimethyl-diaza-(3,6)-cycloheptadien-(1,6)-perchlorate.

4,317,752

PROCESS FOR THE PRODUCTION OF POLYISOCYANATE LIGNIN-CELLULOSE PLASTICS

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Continuation-in-part of Ser. No. 13,139, Feb. 21, 1979, Pat. No. 4,226,982. This application Sep. 8, 1980, Ser. No. 185,397
The portion of the term of this patent subsequent to Oct. 7, 1997, has been disclaimed.
Int. Cl.³ C08G 18/02; C08J 9/02; C08L 1/00
U.S. Cl. 521—159 20 Claims

1. A process for producing polyisocyanate lignin-cellulose plastics by the following steps:
(a) mixing Component B, an organic polyisocyanate, or polyisothiocyanate with Component A, a broken-down alkali metal lignin-cellulose polymer;
(b) agitating the mixture at between 20° C. and 60° C. for 10 to 30 minutes, thereby producing a polyisocyanate alkali metal lignin-cellulose prepolymer;
(c) admixing Component C, an organic additive, and, Component D, a curing agent, with the polyisocyanate alkyl metal lignin-cellulose prepolymer and allowing the resultant mixture to react, wherein said organic additive contains 1 to 9 carbon atoms, has a molecular weight of from 32 to 400 and is selected from the group consisting of monoalcohols, monothioalcohols, monophenols, monothiophenols, halomethyl group containing compounds, esters, ethers, thioethers, ketones, nitro-group-containing compounds, monocarboxylic acid chlorides, monocarboxylic acid bromides, monosulphonic acids or salts thereof, monocarboxylic acid or salts thereof, and aldehydes, with the proviso that when said organic additive is a monoalcohol, monothioalcohol, monophenol, monothiophenol or monocarboxylic acid, said mixing of Components C and D into the polyisocyanate silicate prepolymer takes place substantially simultaneously.

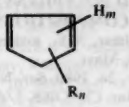
4,317,753

OFFSET INK COMPOSITIONS

Shozo Tsuchiya, Tokyo; Makoto Sasaki, and Hideo Hayashi, both of Yokohama, all of Japan, assignors to Nippon Oil Co., Ltd., Japan

Filed Aug. 20, 1980, Ser. No. 179,696
Claims priority, application Japan, Aug. 23, 1979, 54-106607
Int. Cl.¹ C08L 61/10
U.S. Cl. 524—504 42 Claims

1. An offset ink composition comprising as a vehicle a resin which is the reaction product of 5–100 parts per hundred by weight of a phenol-formaldehyde resin and an acid modified resin, the acid modified resin being the reaction product of 1–15 parts per hundred by weight of an unsaturated carboxylic acid or anhydride thereof and a hydrocarbon resin, the hydrocarbon resin being the copolymerization product of a 5-membered ring compound having a conjugated doubled bond of the formula



in which R is an alkyl group having 1 to 3 carbon atoms and m and n are 0 or a positive integer which together total 6 and/or a Diels-Alder addition product thereof and 10–150 parts per hundred by weight of a codimer of the 5-membered ring compound and 1,3-butadiene.

4,317,754

CURABLE RESIN COMPOSITION

Hajime Hara, Fujisawa; Shingo Orii, Kawasaki, and Yoshihiko Araki, Tokyo, all of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Filed Nov. 25, 1980, Ser. No. 210,303

Claims priority, application Japan, Dec. 6, 1979, 54-157376; Mar. 12, 1980, 55-30254

Int. Cl.³ C08L *61/10*

U.S. Cl. 525—501.5 **14 Claims**

1. A curable resin composition essentially comprising:

(i) an amidated drying oil obtained by reacting a maleic anhydride adduct of a drying oil containing conjugated and/or non-conjugated double bonds and having an iodine value of greater than 100 with ammonia and/or a primary amine to produce an amide of said maleic anhydride adduct, and

(ii) a resol type phenolic resin resulting from the reaction between phenols and formaldehyde in the presence of an alkali catalyst.

4,317,755

SELF-POLISHING SEALING COMPOSITION

Gordon K. Gregory, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Jun. 11, 1980, Ser. No. 158,557

Int. Cl.³ C09G *1/04, 1/10, 1/16*

U.S. Cl. 524—276 **6 Claims**

1. A storage stable, self-polishing, sealing composition for a substrate, which is subject to accumulation of hydrophobic organic residues, which residues reduce the adhesion of said substrate to water-based finishing compositions, said composition comprising: an aqueous vehicle having therein (a) a self-polishing, film-forming polymeric coating agent selected from the group consisting of emulsion coatings, alkali-soluble coatings, solution coatings and mixtures thereof; and (b) an emulsified hydrocarbon solvent (i) having a solubility parameter of from about 7.8 to 9.8 and (ii) present in sufficient amounts to penetrate said accumulated hydrophobic organic residues and increase the adhesion of said substrate to water-based finishing compositions.

4,317,756

SIZING COMPOSITION COMPRISING A HYDROPHOBIC CELLULOSE-REACTIVE SIZING AGENT AND A CATIONIC POLYMER

David H. Dumas, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 932,103, Aug. 9, 1978, Pat. No. 4,243,481. This application Aug. 22, 1980, Ser. No. 180,187

Claims priority, application United Kingdom, Aug. 19, 1977, 34909/77; Aug. 23, 1977, 35285/77

Int. Cl.³ C08L *63/00*

U.S. Cl. 524—607 **5 Claims**

1. A sizing composition in the form of an aqueous emulsion comprising (A) a hydrophobic cellulose-reactive sizing agent and (B) a sufficient amount of a sizing accelerator of a cationic polymer selected from the group consisting of (1) a cationic polymer obtained by reacting an epihalohydrin with a condensate derived by condensing dicyandiamide or cyanamide with bis-aminopropylpiperazine and (2) a cationic polymer obtained by condensing an epihalohydrin with bis-aminopropylpiperazine.

4,317,757

WATER-THINNABLE EPOXY RESIN-SULPHANILIC ACID BINDER COMPOSITIONS

Petrus G. Kooijmans, and Wolfgang Kunze, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 4, 1980, Ser. No. 212,962

Claims priority, application United Kingdom, Jan. 25, 1980, 02542/80

Int. Cl.³ C08L *61/28*

U.S. Cl. 524—541 **8 Claims**

1. A water-thinnable, heat curable binder suitable for coatings prepared by reacting a polyglycidyl ether of a polyhydric phenol with neutralized sulphanilic acid in a ratio of from 0.9 to 1.1 aminohydrogen equivalents per epoxy equivalent.

4,317,758

VISCOSITY-STABILIZED AQUEOUS SOLUTIONS

Donald D. Bruning, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

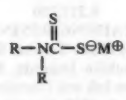
Filed Apr. 28, 1980, Ser. No. 144,085

Int. Cl.³ C08K *5/39*

U.S. Cl. 524—202 **17 Claims**

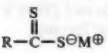
1. A composition of matter comprising an aqueous solution of an acrylamide polymer containing a redox couple or components which can produce a redox couple in the presence of the solution having dissolved therein a viscosity stabilizing amount of a sulfur-containing viscosity stabilizer compound selected from the group consisting of

(a) an alkali metal salt of N,N-dialkyldithiocarbamate acid, represented by the formula



wherein R is an alkyl radical containing one to twelve carbon atoms and M represents alkali metal;

(b) dithioacid salts represented by the formula

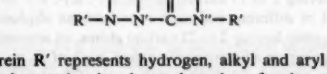


wherein R and M are as previously defined;

(c) thioacid salts represented by the formula

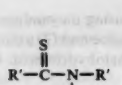
wherein R and M are as previous defined;

(d) thiosemicarbazides represented by the formula



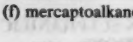
wherein R′ represents hydrogen, alkyl and aryl groups with the proviso that the total number of carbon atoms in the R′ groups does not exceed 24;

(e) thiocarboxamides represented by the formula



wherein R' is as previously defined; and

(f) mercaptoalkanols represented by the formula



wherein R'' represents a polyvalent alkylene radical containing 2 to 20 carbon atoms and the subscripts a and b vary individually over the range of 1 to 3 with the proviso that the sum of a and b does not exceed 4.

4,317,759

STABILIZED AQUEOUS SOLUTIONS OF ACRYLAMIDE POLYMERS

Shoichi Kanda, Yokosuka; Toshikazu Oda, Yokohama; Yasunosuke Tanabe, Tokyo, and Takeshi Arai, Urawa, all of Japan, assignors to Nitto Kagaku Kogyo Kabushiki Kaisha and Kawaguchi Kagaku Kogyo Kabushiki Kaisha, both of, Japan

Filed Mar. 9, 1981, Ser. No. 241,527

Claims priority, application Japan, Mar. 21, 1980, 55-34732

Int. Cl.³ C08L 0/00

U.S. Cl. 524—93 **3 Claims**

1. A stabilized aqueous acrylamide polymer solution containing in combination a stabilizing quantity of a 2-mercaptobenzimidazole compound and a phenolic anti-oxidant compound.

4,317,760

HALOGEN-CONTAINING RESIN COMPOSITION

Katsuhiro Tsuda, Sakai; Hisao Tanaka, Sennan; Michio Nagae, Izumiohtsu, and Yasuhiko Imanaga, Kaizuka, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

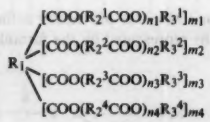
Filed Aug. 6, 1980, Ser. No. 175,764

Claims priority, application Japan, Jul. 31, 1979, 54-97560

Int. Cl.³ C08K 5/15, 5/10, 5/11

U.S. Cl. 524—111 **17 Claims**

1. A halogen-containing resin composition comprising (1) a halogen-containing resin and (2) as a plasticizer, at least one compound of the general formula



wherein R_1 represents an aromatic hydrocarbon group containing 1 or 2 aromatic rings or an alicyclic hydrocarbon group having 4 to 37 carbon atoms, R_2^1, R_2^2, R_2^3 and R_2^4 are identical or different and each represents an aliphatic hydrocarbon group having 2 to 17 carbon atoms, R_3^1, R_3^2, R_3^3 and R_3^4 are identical or different and each represents an aliphatic hydrocarbon group having 2 to 22 carbon atoms, an aromatic hydrocarbon group or a heterocyclic group, each of n_1, n_2, n_3 and n_4 is 0 or an integer of 1 to 20 and the sum of these is 1 to 20, and each of m_1, m_2, m_3 and m_4 is 0 or 1 and the sum of these is 3 or 4.

4,317,761

CLAY FILLED POLYPHENYLENE ETHER COMPOSITIONS

Visvaldis Abolins, Delmar, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Filed Nov. 24, 1980, Ser. No. 209,797

Int. Cl.³ C08K 5/49

U.S. Cl. 524—141 **10 Claims**

1. A thermoplastic composition comprising:

(a) a polyphenylene ether resin, alone, or together with an impact modifier;

(b) an effective amount of a plasticizer; and

(c) a particulate clay filler having a mean particle size no greater than 0.6 micron and a surface area of at least 15 square meters per gram

---

4,317,762

ROOM TEMPERATURE VULCANIZABLE ORGANOPOLYSILOXANE COMPOSITIONS

Günter Kratel; Günter Stohr, both of Durach-Bechen, and Heinz Scherer, Burghausen, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Apr. 28, 1980, Ser. No. 144,493

Claims priority, application Fed. Rep. of Germany, May 2, 1979, 2917727

Int. Cl.³ C08L 83/06

U.S. Cl. 523—203 **5 Claims**

1. A room temperature vulcanizable composition which may be stored under anhydrous conditions, but when exposed to atmospheric moisture, cures to form an elastomer, comprising a diorganopolysiloxane having terminal condensable groups, a silicon compound having at least three Si-bonded hydrolyzable groups and an inorganic filler having a surface area of at least 20 m^2/g, in which at least a portion of the surface of the inorganic filler contains a polymer obtained from the polymerization, in the presence of the filler of at least one compound of the formula

$$HR^1C{=}CHX,$$

where X is selected from the group consisting of a —CN group or a group of the formula —$COOR^2$, R^2 is an alkyl radical having from 1 to 4 carbon atoms and R^1 is selected from the group consisting of hydrogen and a methyl radical.

4,317,763

CATALYSTS AND BINDER SYSTEMS FOR MANUFACTURING SAND SHAPES

James E. Menting, Algonquin, Ill., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Mar. 24, 1980, Ser. No. 132,894

Int. Cl.³ C08L 61/06

U.S. Cl. 523—144 **17 Claims**

1. A method of preparing a core and sand material adapted for the rapid manufacture of resin bound sand shapes, said method including treating a core sand material with a catalyst material to form a treated core sand material, and thoroughly mixing said treated core sand material with from about 0.5% to about 5%, based on the weight of said sand, of a curable resin binder material to provide a curable core sand material capable of being cured in a core-making pattern less than one minute at a temperature of at least 250° F., said catalyst material comprising at least one salt made from a weak base and an acid from the group comprising lower aliphatic and aromatic sulfonic acids, said catalyst material being present in an amount by weight of from about 5% to about 40% of the weight of said resin binder material.

4,317,764
POLYBUTYLENE TEREPHTHALATE MOLDING BLENDS

M. Lana Sheer, Chadds Ford, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 10, 1981, Ser. No. 252,884
Int. Cl.³ C03L *67/00*
U.S. Cl. 524—449 **12 Claims**

1. A polybutylene terephthalate molding blend consisting essentially of

(a) 20–95% by weight of blend of polybutylene terephthalate having an inherent viscosity of at least about 0.5, or a copolymer of polybutylene terephthalate and less than 50% by weight of a comonomer polymerizable therewith;

(b) 0.1–10% by weight of blend of an organic compound having a molecular weight less than 16000 which is selected from the class consisting of a polyalkylene oxide and a polyhexamethylene adipamide oligomer; and

(c) 5–35% by weight of blend of an ethylene polymer containing ester or acid functionality and having a modulus less than 50,000 psi.

4,317,765
COMPATIBILIZATION OF HYDROXYL-CONTAINING FILLERS AND THERMOPLASTIC POLYMERS

Norman G. Gaylord, New Providence, N.J., assignor to Champion International Corporation, Stamford, Conn.

Continuation of Ser. No. 643,820, Dec. 23, 1975, Pat. No. 4,071,494, which is a continuation-in-part of Ser. No. 66,107, Aug. 21, 1970, Pat. No. 3,956,230, which is a continuation-in-part of Ser. No. 702,204, Feb. 1, 1968, Pat. No. 3,645,939. This application Jan. 26, 1977, Ser. No. 762,641
The portion of the term of this patent subsequent to May 11, 1993, has been disclaimed.
Int. Cl.³ C08K *9/04, 9/10*
U.S. Cl. 523—204 **2 Claims**

1. A compatibilized, filled polyolefin composition obtained by a process which comprises encapsulating hydroxyl group containing filler particles with a coating of a polyolefin by mixing said filler particles and said polyolefin and thereafter mixing with maleic anhydride or poly(maleic anhydride) and a free radical catalyst under conditions which will generate free radicals on the polyolefin, whereby said polyolefin coating is coupled to said filler, said composition being thermoplastic.

4,317,766
FLAME-RETARDANT POLYAMIDE RESIN COMPOSITION WITH MELAMINE CYANURATE UNIFORMLY DISPERSED THEREIN

Hironobu Kawasaki; Kouichirou Yoshida, and Tomoo Itoh, all of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Sep. 14, 1979, Ser. No. 75,596
Claims priority, application Japan, Sep. 18, 1978, 53/114355
Int. Cl.³ C08K *5/34*
U.S. Cl. 524—101 **8 Claims**

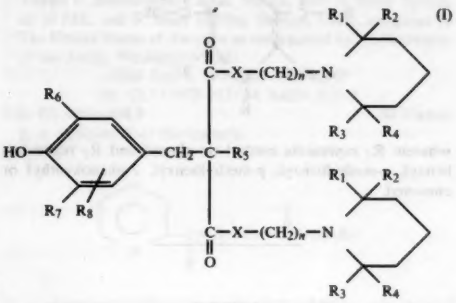
1. A flame-retardant polyamide composition which comprises 98 to 75% by weight of a polyamide and 2 to 25% by weight of melamine cyanurate prepared by a process comprising admixing with a polyamide-forming monomer substantially equimolar quantities of melamine and cyanuric acid and water in an amount sufficient to cause a neutralization reaction between melamine and cyanuric acid and heating the resulting mixture to cause the monomer to polymerize and the melamine and cyanuric acid to react; said process resulting in a product composition consisting essentially of a polyamide matrix containing melamine cyanurate particles in a state of uniform dispersion within the matrix.

4,317,767
STABILIZERS FOR POLYMERS AND POLYMERS STABILIZED THEREBY

Piero Di Battista, and Francesco Gratani, both of Milan, Italy, assignors to Montedison S.p.A., Milan, Italy

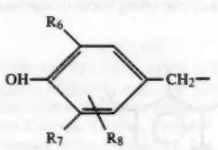
Filed Jan. 30, 1980, Ser. No. 116,850
Claims priority, application Italy, Feb. 1, 1979, 19761 A/79
Int. Cl.³ C08K *5/34*
U.S. Cl. 524—102 **11 Claims**

1. Compositions comprising synthetic thermoplastic polymers stabilized to oxidation, heat and light, and having incorporated therein, in an amount sufficient to prevent degradation of the polymer, a N-alkyl-piperidine derivative of the hydroxybenzyl-malonic acid having formula



(I)

wherein each of R_1, R_2, R_3 and R_4, which may be the same or different, is an alkyl radical having 1 to 6 carbon atoms or R_1 and R_2 together and $R_3$and R_4 together form a cycloalkyl radical having 5 to 8 carbon atoms; R_5 is hydrogen, an alkyl radical having 1 to 18 carbon atoms or a 4-hydroxy-benzyl group of the formula



(II)

in which of R_6 and R_7, which may be the same or different, is hydrogen, an alkyl radical having 1 to 6 carbon atoms, an aralkyl radical having 7 to 9 carbon atoms or a cyclo alkyl radical having 5 to 8 carbon atoms; R_8 is hydrogen or an alkyl radical having 1 to 6 carbon atoms; n is an integer comprised between 1 and 12, and X is oxygen or

group, wherein R_9 is hydrogen, an alkyl radical having 1 to 18 carbon atoms, an alkenyl radical having 3 to 4 carbon atoms, a cyclo-alkyl radical having 4 to 12 carbon atoms, an aryl radical having 6 to 12 carbon atoms or an aralkyl radical having 7 to 9 carbon atoms.

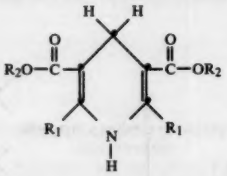
4,317,768

DIHYDROPYRIDINE DERIVATIVES AS STABILIZERS FOR VINYL CHLORIDE POLYMERS

Charles Pigerol, Saint-Ouen; Marie-Madeleine Chandavoine, and Paul de Cointet de Fillain, both of Sisteron, all of France, assignors to Labaz, Paris, France

Continuation of Ser. No. 946,351, Sep. 27, 1978, abandoned. This application Nov. 13, 1979, Ser. No. 93,861
Claims priority, application France, Oct. 14, 1977, 77 30992
Int. Cl.³ C08K 5/34
U.S. Cl. 524—99 9 Claims

1. Process for stabilizing a vinyl resin whereby a stabilizer of the following formula is introduced into a polymer or copolymer of vinyl chloride:



I

wherein R_1 represents methyl or phenyl and R_2 represents benzyl, o-methylbenzyl, p-methylbenzyl, 2-phenoxyethyl or cinnamyl.

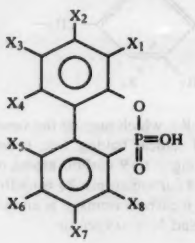
4,317,769

FLAME RETARDANTS

Toranosuke Saito, Ibaragi, and Hiroyuki Ohishi, Moriyama, both of Japan, assignors to Sanko Kaihatsu Kagaku Kenkyusho, Osaka, Japan

Filed Mar. 19, 1980, Ser. No. 131,722
Claims priority, application Japan, Mar. 19, 1979, 54-31162; Jan. 25, 1980, 55-6906
Int. Cl.³ C07F 9/38; C08K 5/53
U.S. Cl. 524—117 7 Claims

1. . . flame retardant comprising alkali metal and/or alkaline earth metal salts of a cyclic phosphorus compound represented by formula I,



I

wherein each of X_1 to X_8 represents hydrogen, halogen, cyano, acyl, alkyl, halogen-substituted alkyl, aryl, halogen-substituted aryl or aralkyl.

6. A flame retardant resin composition comprising 100 parts by weight of a substrate selected from the group consisting of an aromatic polycarbonate resin and a polycondensate or copolycondensate of an aromatic dihydroxyl compound with an aromatic dicarboxylic acid, 0.02 to 5 parts by weight of alkali metal and/or alkaline earth metal salts of a cyclic phosphorus compound represented by the formula I of claim 1 and 0 to 5 parts by weight of an organohalogen compound.

4,317,770

D-AMINO ACID ANALOGS OF BETA-ENDORPHIN

Choh Hao Li, Berkeley, Calif., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Mar. 11, 1977, Ser. No. 776,569
Int. Cl.³ C07C 103/52
U.S. Cl. 260—112.5 E 3 Claims

1. A [D-Ala²]β-endorphin analog.

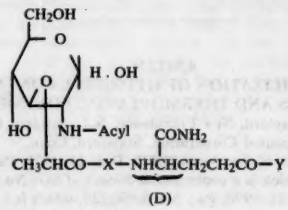
4,317,771

MURAMYLDIPEPTIDE DERIVATIVES

Tetsuo Shiba, Toyonaka; Shozo Kotani, Minoo; Yuichi Yamamura, Takarazuka; Osamu Nagase, and Hidemasa Ogawa, both of Tokyo, all of Japan, assignors to Daiichi Seiyaku Co., Ltd., Tokyo, Japan

Filed Jun. 23, 1980, Ser. No. 162,233
Claims priority, application Japan, Jun. 21, 1979, 54-78317
Int. Cl.³ C07C 103/52; A61K 39/00
U.S. Cl. 260—112.5 R 10 Claims

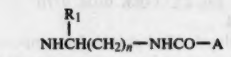
1. A muramyldipeptide derivative of the formula (I):



(I)

(D)

wherein X represents an amino acid residue of L-alanine, L-serine, L-valine or glycine, and Y represents



wherein R_1 represents a hydrogen atom, an alkyl group of 1 to 6 carbon atoms, a carboxamide group or a carboxy group, n represents an integer of 1 to 6, A represents a straight or branched chain, saturated or unsaturated aliphatic hydrocarbon residue of 7 to 30 carbon atoms, and "Acyl" means an acyl group of an aliphatic carboxylic acid having 2 to 6 carbon atoms.

4,317,772

PROCESS FOR PREPARATION OF AMINATED SULFURIZED OLEFINS USING ALKALINE EARTH METAL COMPOUNDS

J. Ronald Spence, Bartlesville, Okla., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Oct. 10, 1980, Ser. No. 196,041
Int. Cl.³ C07G 17/00
U.S. Cl. 260—132 5 Claims

1. In a process for producing an aminated sulfurized olefin composition which comprises reacting a substantially amorphous polyolefin, about 0.1 to 20.0 moles of sulfur or a sulfur-yielding compound per mole of polyolefin and about 0.01 to 20.0 moles of a polyamine per mole of polyolefin at a temperature of about 40° to 400° C., to produce an aminated sulfurized olefin contaminated with a tarry and charred reaction by-product, the improvement comprising reacting the polyolefin, sulfur or sulfur-yielding compound, and polyamine with about 1 to 10 parts of an alkaline earth metal compound per 100 parts of reaction mixture to absorb the tarry and charred reaction by-product forming a tarry-metal compound product and readily separating the tarry-metal compound product from the aminated sulfurized olefin.

4,317,773
INORGANOCYCLIC COMPOUNDS USABLE AS MEDICAMENTS AND A PROCESS FOR THEIR PREPARATION

Jean-François Labarre; François Sournies, both of Toulouse, France; Johan C. van de Grampel, Paterswolde, and Andriaan A. van der Huizen, Groningen, both of Netherlands, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), France

Filed Jun. 25, 1980, Ser. No. 162,759
Claims priority, application France, Jul. 4, 1979, 79 17336
Int. Cl.³ C07F *9/56*; A61K *31/675*
U.S. Cl. 260—239 EP **6 Claims**

1. Compounds corresponding to the following formula:

(I)

in which R is a radical which cannot be hydrolysed at a neutral pH and at room temperature selected from the group consisting of a halogen atom, a hydroxy radical, an amino radical, an alkyl or an alkoxy radical of 1 to 7 carbon atoms, an alkenyl or alkynyl radical of 2 to 7 carbon atoms, a monocyclic aryl or aryloxy radical, and an N-alkyl or N,N-dialkyl amino radical, and Az is an unsubstituted 1-aziridinyl radical or a 1-aziridinyl radical substituted with an alkyl or an alkoxy radical of 1 to 7 carbon atoms.

4,317,774
6-[D-α-(COUMARIN-3-CARBOXAMIDO)ARYLACETAMIDO]-PENICILLANIC ACIDS OR SALTS

Martin L. Sassiver, Monsey, N.Y., and James H. Boothe, Montvale, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Mar. 24, 1978, Ser. No. 889,675
Int. Cl.³ C07D *499/70*
U.S. Cl. 260—239.1 **2 Claims**

1. A compound selected from the group consisting of 6-[D-α-(8-methoxycarbonyloxycoumarin-3-carboxamido)-phenylacetamido]penicillanic acid and the pharmacologically acceptable cationic salts thereof.

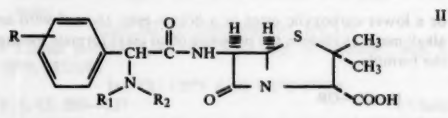
2. A compound selected from the group consisting of 6-[D-α-(5-azacoumarin-3-carboxamido)phenylacetamido]penicillanic acid and the pharmacologically acceptable cationic salts thereof.

4,317,775
AMOXICILLIN DERIVATIVES

Kasper F. Burri, Kaiseraugst, Switzerland, and Perry Rosen, North Caldwell, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jan. 7, 1980, Ser. No. 110,275
Int. Cl.³ C07D *499/70*
U.S. Cl. 260—239.1 **5 Claims**

1. A compound of the formula:



II

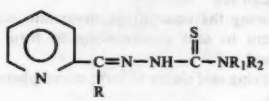
wherein R is hydrogen or hydroxy, R_1 and R_2 are individually hydrogen, or a saturated heterocyclic 5 to 6 membered ring containing one hetero atom selected from the group consisting of oxygen and sulfur, said hetero atom being positioned in said ring adjacent the carbon atom in said ring connected to the nitrogen atom, said ring being unsubstituted or substituted in one or more positions with lower alkyl or halogen, with the proviso that at least one of R_1 and R_2 is other than hydrogen; salts, hydrates or esters thereof.

4,317,776
2-ACETYL-AND 2-PROPIONYLPYRIDINE THIOSEMICARBAZONES

Daniel L. Klayman, Chevy Chase; John P. Scovill, Rockville; Joseph F. Bartosevich; Carl J. Mason, both of Silver Spring, all of Md., and T. Scott Griffin, Orange, Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 4, 1979, Ser. No. 4,247
Int. Cl.³ C07D *211/24*; A61N *31/44*
U.S. Cl. 260—244.4 **11 Claims**

1. A compound of the formula



or a pharmaceutically-acceptable acid addition salt thereof wherein R is methyl or ethyl; and R_1 and R_2 are taken together with the nitrogen atom to which they are attached to form a heterocyclic ring selected from the group consisting of (1) alkylenimino; and (2) alkylenimino which may contain one double bond and/or is mono- disubstituted with alkyl, hydroxy, phenyl or benzyl.

4,317,777
PRODUCTION OF MALEIC ACID AND ANHYDRIDE

Raymond Higgins, Middlesbrough, and Graham J. Hutchings, Northallerton, both of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 6,554, Jan. 25, 1979, Pat. No. 4,222,945. This application Apr. 8, 1980, Ser. No. 138,318
Claims priority, application United Kingdom, Jan. 30, 1978, 3686/78; Feb. 6, 1978, 4657/78; Nov. 20, 1978, 45295/78
The portion of the term of this patent subsequent to Sep. 16, 1997, has been disclaimed.
Int. Cl.³ C07D *307/60*
U.S. Cl. 260—346.75 **6 Claims**

1. A process for producing maleic anhydride which comprises oxidising 10 to 50% of a hydrocarbon which comprises at least 4 linear carbon atoms by contacting it with oxygen, the hydrocarbon concentration being greater than 10 molar percent and being higher than the flammable limit, the oxygen concentration being greater than 13 molar percent and the concentration of inert gas being greater than 70 molar percent of the total material fed to the reaction, in the presence of a catalyst which consists essentially of a phosphorus/vanadium mixed oxide, the atomic ratio of vanadium to phosphorus being in the range 0.5:1 to 2:1, the surface area of the catalyst being at least 10 sq meters per gram.

4,317,778

PREPARATION OF MALEIC ANHYDRIDE USING FLUIDIZED CATALYSTS

Patricia R. Blum, Macedonia, and Mark L. Nicholas, Cleveland, both of Ohio, assignors to Standard Oil Company (SOHIO), Cleveland, Ohio

Filed Dec. 29, 1980, Ser. No. 220,624
Int. Cl.[3] C07D *307/60*
U.S. Cl. 260—346.75 16 Claims

1. A process for the production of maleic anhydride by the oxidation of 4-carbon hydrocarbons with molecular oxygen or an oxygen containing gas in a fluid bed reactor at a reaction temperature of about 250° C. to 600° C. in the presence of a microspheroidal, fluidizable catalyst containing the mixed oxides of vanadium and phosphorus, wherein said catalyst is prepared by

(a) introducing at least one pentavalent vanadium compound into an organic liquid capable of reducing at least a portion of the vanadium to a valence state of +4;

(b) effecting reduction of at least a portion of the vanadium to a valence state of +4;

(c) contacting the vanadium with a mixed phosphorus component prior or subsequent to effecting said reduction, wherein said mixed phosphorus component comprises about 75–90 weight percent orthophosphoric acid and about 10–25 weight percent pyrophosphoric acid;

(d) comminuting the catalyst precursor resulting from steps (a) through (c);

(e) introducing the catalyst precursor into water prior or subsequent to said comminuting to form an aqueous slurry; and

(f) spray drying said slurry to form microspheroidal catalyst particles.

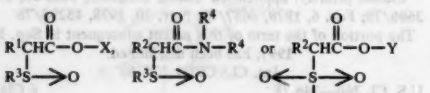
4,317,779

ALPHA-SULFOXIDE AND ALPHA-SULFONE CARBOXYL COMPOUNDS

Robert J. Crawford, Wyoming, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Aug. 21, 1980, Ser. No. 180,213
Int. Cl.[3] C07C *143/90*; C11D *1/28*
U.S. Cl. 260—400 18 Claims

1. A compound of the formula:



wherein R^1 is a C_{10}–C_{18} hydrocarbyl group; R^2 is a C_6–C_{18} hydrocarbyl group; R^3 is a C_1–C_4 hydrocarbyl group; each R^4 is hydrogen, a C_1–C_4 hydrocarbyl group, or a C_2–C_3 alkylene oxide group, or mixtures thereof, containing from about 1 to about 10 alkylene oxide units; X is an R^4 group or a water-soluble metal, ammonium or substituted ammonium cation; and Y is hydrogen, a water-soluble metal, ammonium or substituted ammonium cation or a C_2–C_3 alkylene oxide group, or mixtures thereof, containing from about 1 to about 10 alkylene oxide units.

4,317,780

ORGANIC ESTER FOR USE IN LUBRICANT COMPOSITIONS

Giuseppe Mancini, Melegnano; Luigi Imparato, Milan, and Franco Berti, San Donato Milanese, all of Italy, assignors to Snamprogetti S.p.A., Milan, Italy

Continuation of Ser. No. 971,814, Dec. 21, 1978, abandoned, which is a continuation of Ser. No. 908,357, May 22, 1978, abandoned, which is a continuation of Ser. No. 731,992, Oct. 13, 1976, abandoned. This application Jan. 7, 1980, Ser. No. 110,189
Claims priority, application Italy, Dec. 11, 1975, 30195 A/75
Int. Cl.[3] C09F *5/08*; C11C *3/00*
U.S. Cl. 260—410.6 8 Claims

1. A mixture of esters, for use in a lubricating composition, said esters being prepared by a process which consists of the esterification of:

(a) a mixture of bifunctional and trifunctional pentylpolyols wherein the molar ratio of the bifunctional neopentylpolyols to the trifunctional neopentylpolyols as in the range of 1:2.5 to 1:10 and

(b) a mixture of saturated monocarboxylic acids consisting of:

Group I, containing one or more acids having from 8 to 10 carbon atoms; and

Group II, containing one or more acids having from 12 to 18 carbon atoms; the molar ratio of the acids in Group I to the acids in Group II being in the range from 2.5:1 to 18:1.

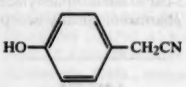
4,317,781

PROCESS FOR THE MANUFACTURE OF P-HYDROXYBENZYL CYANIDE

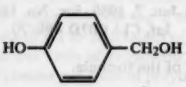
Jonathan Hutton, Adlington, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Apr. 13, 1981, Ser. No. 253,267
Claims priority, application United Kingdom, Apr. 23, 1980, 13325/80
Int. Cl.[3] C07C *120/06*, *121/75*
U.S. Cl. 260—465 F 10 Claims

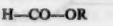
1. A process for the manufacture of p-hydroxybenzyl cyanide having the formula:



which comprises the reaction of p-hydroxybenzyl alcohol having the formula:



or a lower carboxylic ester or a borate ester thereof with an alkali metal cyanide in the presence of an alkyl formate having the formula:



wherein R is alkyl of up to 6 carbon atoms.

4,317,782

DISTYRYL COMPOUNDS

Udo Eckstein, Cologne, and Edgar Siegel, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

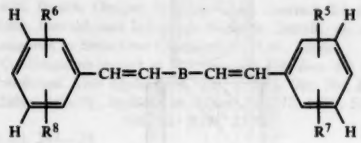
Filed Feb. 22, 1979, Ser. No. 13,894

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1978, 2807497

Int. Cl.³ C07C 9/40; C09K 11/02; C07F 9/53

U.S. Cl. 260—932 3 Claims

1. Distyryl compounds of the formula (II)



(II)

wherein

B denotes 1,4-phenylene, 4,4'-biphenylene, 1,4- and 2,6-naphthylene, 9,10-dihydro-2,7-phenanthrenylene or 2,7-dibenzofuranylene,

R^5 denotes a radical of the formula

R^6 denotes hydrogen, chlorine, C_1–C_4-alkyl, sulpho, carboxyl, C_1–C_4-alkoxy, C_1–C_4-alkoxycarbonyl, cyano or a radical of the formula

R^7 and R^8 denote hydrogen, chlorine, C_1–C_4-alkyl, phenyl which is optionally substituted by methyl, methoxy or chlorine, C_1–C_4-alkoxy, C_1–C_4-alkoxycarbonl, cyano, C_1–C_4-alkylsulphonyl, C_1–C_4-alkylcarbonyl, hydroxyl or carboxyl, R^9 and R^{10} denote C_1–C_4-alkyl, benzyl, phenyl which is optionally substituted by methyl, methoxy or chlorine or a group of the formula $(OCH_2CH_2)_n$-OR^{11} wherein

R^{11} is hydrogen, C_1–C_4-alkyl, benzyl or phenyl and

n is 0 to 7,

it being possible for the phosphonic acid group also to be in the form of a salt.

4,317,783

1-OXO-3-METHYL-2-BUTENE PHOSPHONIC ACID ESTERS

Hellmut Hoffmann, Wuppertal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

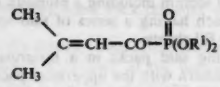
Filed Jul. 21, 1980, Ser. No. 170,377

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1979, 2932262

Int. Cl.³ C07F 9/40; C07C 57/66

U.S. Cl. 260—937 1 Claim

1. A 1-oxo-3-methyl-2-butene-phosphonic acid ester of the formula



in which

R^1 is C_1–C_4-alkyl or phenyl, or

the two radicals R^1 together are 2,2-dimethyl-propane-1,3-diyl.

4,317,784

ADJUST SCREW DEVICE FOR CARBURETOR

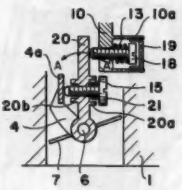
Yuzo Kato, Toyota; Hidenori Tateno, Aichi, and Mikitoshi Kako, Tokai, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota and Aisan Kogyo Kabushiki Kaisha, Ohfu, both of, Japan

Filed Dec. 5, 1980, Ser. No. 213,578

Claims priority, application Japan, Dec. 29, 1979, 54-181957[U]

Int. Cl.³ F02M 19/12

U.S. Cl. 261—65 26 Claims



1. An adjustment screw device for a carburetor for an internal combustion engine, said carburetor having a throttle lever for controlling a throttle valve, and for installation on a stationary member in the vicinity of the throttle lever, the device comprising:

a first adjust screw rotatable with respect to the stationary member over a relatively large range for initially presetting the R.P.M. of the engine;

a second adjust screw for relatively finely adjusting of the R.P.M. of the engine, the leading end of said second adjust screw abutting the throttle lever, said second adjust screw being continuously accessible for adjustment;

means for moving said second adjust screw to and from said throttle lever in accordance with the rotation of said first adjust screw; and

means for blocking access to said first adjust screw after said initial presetting.

4,317,785

WATER COOLING TOWER HAVING COMBINATION SPLASH AND FILM FILL STRUCTURE

Joe B. Dickey, Jr., Fairway, Kans.; Ivan F. Kuharic, Kansas City, Mo., and Paul A. Lindahl, Jr., Shawnee Mission, Kans., assignors to The Marley Company, Mission, Kans.

Filed Feb. 20, 1981, Ser. No. 237,863

Int. Cl.³ B01F 3/04

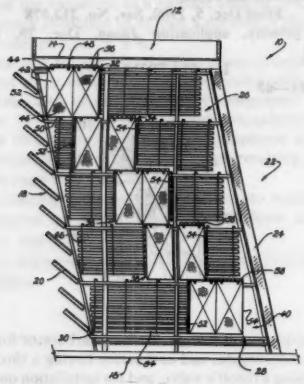
U.S. Cl. 261—111 7 Claims

1. A crossflow water cooling tower fill assembly for receiving and dispersing quantities of descending, initially hot water, and for causing currents of crossflowing, ambient-derived cooling air drawn through said fill assembly to come into crossflowing, intersecting, thermal interchange relationship to said descending water, said fill assembly comprising:

a film fill section having a series of spaced, opposed, face-to-face fill sheets which cooperatively present an upper water entrance face, an opposed, lower, water exit face, an outboard air entrance face and an opposed, inboard air

exit face, said respective faces being substantially separate, said film fill section including a plurality of separate film fill packs each having a series of said spaced, opposed, face-to-face fill sheets;

means mounting said packs in a progressively inwardly staggered pattern with the uppermost pack of the section being the outermost pack, and the lowermost pack being the innermost pack, each of said packs presenting an upper water entrance subface, an opposed, lower water exit subface, an outboard air entrance subface, an opposed, inboard air exit subface, the respective subfaces of each pack being substantially separate, the water entrance subfaces of said packs cooperatively defining said upper water entrance face of the overall film fill section, the water exit subfaces of said packs cooperatively defining said lower water exit face of the overall film fill section, the air entrance subfaces of said packs cooperatively defining the outboard air entrance face of the overall film fill



section, and the air exit subfaces of said packs cooperatively defining the inboard air exit face of the overall film fill section;

water distribution and airflow restricting means for dispersing water prior to entrance thereof into said film fill section through said water entrance face, and for inhibiting exit flow of air currents traveling through said section out of said upper water entrance face,

said water distribution and airflow restricting means comprising individual water distributing and airflow restricting elements respectively disposed above corresponding water entrance subfaces for inhibiting exit flow of air currents traveling through the associated packs out of the upper water entrance subface thereof; and

a splash fill section located in side-by-side relationship to said film fill section and including a plurality of splash bars for dispersing additional quantities of said descending water.

4,317,786

APPARATUS FOR DISTRIBUTING A LIQUID IN FILM-FORM ON THE INTERIOR WALLS OF VERTICAL TUBES

Vincenzo Lagana', Milan, Italy, assignor to Snamprogetti S.p.A., Milan, Italy

Filed Dec. 11, 1980, Ser. No. 215,170

Claims priority, application Italy, Jun. 5, 1980, 22561 A/80

Int. Cl.³ B01F 3/04

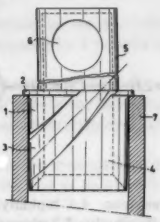
U.S. Cl. 261—112 **9 Claims**

1. In a distributor for causing liquid to be conveyed in the form of film on the inner wall of an essentially vertical tube, the improvement which comprises:

a generally cylindrical member slidably insertable in the upper end of the tube adapted to be rotated slowly for even distribution of liquid and for inhibiting the formation of deposits of solids on the inner wall of the tube,

a ledge at the upper end of said member which abuts the upper end of the tube to limit the insertion of said member to the upper end thereof,

helical grooves in the outer surface of said member which extend from the top of said ledge to the bottom of said member and which are open to the inner wall of the tube therebetween for receiving liquid to be distributed and for conveying such liquid within and along the length of said



helical grooves and from the lower ends thereof onto the inner wall of the tube, and

said member being tapered downwardly and inwardly from its upper portion of the lowermost end from about one degree to about two degrees to provide a clearance space between said member and the inner wall open to said grooves, wherein the downward flow of liquid being distributed from said grooves and space induces rotation of said member for even distribution of liquid in film form and for inhibiting the formation of deposits from the solids in the liquid on the inner wall of the tube.

4,317,787

DEVICE FOR DISTRIBUTING A LIQUID IN THIN-FILM FORM IN VERTICAL HEAT-EXCHANGERS

Vincenzo Lagana', Milan, Italy, assignor to Snamprogetti S.p.A., Milan, Italy

Filed Dec. 11, 1980, Ser. No. 215,171

Claims priority, application Italy, May 16, 1980, 22118 A/80

Int. Cl.³ B01F 3/04

U.S. Cl. 261—112 **7 Claims**

1. In a device for distributing a liquid in the form of a thin film in vertical heat-exchanging apparatus comprising an outer casing having an opening for feeding the liquid to be processed, an opening for discharging the processed liquid, an opening for venting off gases and vapors, a liquid distributor for spreading said liquid over the internal cross-sectional area of said casing and means for supporting said distributor, a packing bed through which the distributed liquid percolates, internally hollow reeds for distributing the percolated liquid in the film form into tubes of an underlying tube bundle, each of said reeds having tangential bores extending through the intermediate section of its peripheral surface, a top tube plate secured to the casing wall and in which there are inserted the top

end sections of the tubes of said bundle with the reeds inserted into the top portion of the tubes of said tube bundle, the improvement including having said liquid-distributing reeds sealed at their tops with perforations through their peripheral surfaces in the vicinity of the sealed tops for discharging gases and vapors, a grid of parallel bars each of which rests on the edges of any two adjoining reed rows, and a mesh on and supported by said grid which sustains said packing bed.

4,317,788

METHOD FOR MODIFYING SURFACE PROPERTIES OF A SHAPED ARTICLE OF AN ACRYLIC RESIN

Kiyoshi Imada, Omiya; Susumu Ueno, Ibaraki; Yasuhide Nishina, Ibaraki, and Hirokazu Nomura, Ibaraki, all of Japan, assignors to Shin-Etsu Chemical Co. Ltd., Japan

Continuation-in-part of Ser. No. 158,255, Jun. 10, 1980, abandoned. This application Feb. 2, 1981, Ser. No. 230,542
Claims priority, application Japan, Jun. 18, 1979, 54-76444
Int. Cl.³ B29C *25/00*
U.S. Cl. 264—22 **4 Claims**

1. A method for modifying the surface properties of a shaped article of an acrylic resin containing no surface active agent which comprises the steps of

(a) subjecting the surface of the shaped article to exposure to low temperature plasma of a gas having no polymerizability in the plasma condition,

(b) bringing the plasma-treated surface of the shaped article into contact with an aqueous liquid containing a surface active agent,

(c) rinsing the surface of the shaped article with water, and

(d) drying the surface of the shaped article.

4,317,789

METHOD OF MAKING THIN POROUS STRIPS FOR FUEL CELL ELECTRODES

Pierre Groult, Etrechy; Danielle Civier, Longpont sur Orge, and Jacques Prehaut, Brie Comte Robert, all of France, assignors to Societe Generale de Constructions Electriques et Mechaniques "Alsthom et Cie", Paris, France

Filed Oct. 14, 1980, Ser. No. 196,681
Claims priority, application France, Oct. 18, 1979, 79 25877
Int. Cl.³ C04B *35/00*
U.S. Cl. 264—105 **17 Claims**

1. A method of making a porous strip for use in an electrode of a fuel cell, the method comprising:

(a) mixing a balanced pH degassed aqueous dispersion of carbon powder with a balanced pH emulsion of a binder at a temperature below that at which spontaneous precipitation will occur;

(b) precipitating the binder onto the carbon powder grains;

(c) drying the precipitate of binder-coated carbon grains;

(d) crushing the dried precipitate;

(e) wetting the precipitate before the completion of step (g) with a lubricating liquid to provide a wetted powder of binder-coated carbon grains moistened sufficiently to prevent adherence of the powder to the rolls of a calender;

(f) feeding the wetted powder, without support, into a calender; and

(g) calendering the wetted powder into a self-supporting thin porous strip.

4,317,790

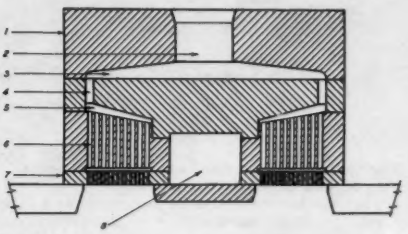
SPINNING PROCESS

Edwin J. Siegman, Pensacola, and Roy L. Yelverton, Gulf Breeze, both of Fla., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 13,345, Feb. 21, 1979, Pat. No. 4,276,011. This application Oct. 27, 1980, Ser. No. 200,730
Int. Cl.³ D01F *6/18*
U.S. Cl. 264—176 F **5 Claims**

1. A process for spinning a fusion melt of acrylonitrile polymer and water which comprises extruding said melt through a circular spinnerette assembly for extruding hardenable fluid material at substantially equal back pressure which comprises in combination

a. a circular body member containing at the top in the central area thereof a conduit, at the bottom a spinnerette plate containing a plurality of orifices with counterbores, said orifices being arranged in concentric circular rows about the center of said circular body with the number of orifices in each row decreasing as the rows approach the center, and located within said circular body from top to bottom in the order named



b. a first tapered passageway at the exit of said conduit decreasing in volume from the center to the outer periphery of said body,

c. collector means at the exit of said first passageway and at the outer periphery of said body,

d. a second tapered passageway at the exit of said collector means which tapers towards the center of said body and communicates with

e. a plurality of distribution chambers having lengths which decrease as their position within said body approaches the center of said body and which chambers communicate with the plurality of counterbores and orifices of said spinnerette plate.

4,317,791

PROCESS FOR THE PRODUCTION OF NON-CELLULAR MOLDED ARTICLES

Heimo Lüdke, Bergisch-Gladbach; Peter Günther, Odenthal, and Helmut Kleimann, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 5, 1977, Ser. No. 812,946
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1976, 2631167
Int. Cl.³ B29C *5/00*; C08G *18/08*
U.S. Cl. 264—297 **3 Claims**

1. A process for the successive production of at least two non-cellular molded articles differing in their mechanical characteristics and both of which are based on organic polyisocyanates, wherein organic polyisocyanates are subjected to a polymerization reaction in closed molds in the presence of compounds effecting the trimerization of isocyanate groups, optionally in the presence of organic compounds having groups which are reactive with isocyanate groups but always provided that the equivalent ratio of isocyanate groups to groups which are reactive with isocyanate groups is at least 1:0.8, and optionally in the presence of other auxiliary agents and additives but in the absence of blowing agents, and in cases where compounds having groups which are reactive with isocyanate groups are present, said organic polyisocyanates may at the same time be subjected to an isocyanate addition reaction, characterized in that alteration of the mechanical properties of the molded articles is achieved simply by varying the equivalent ratio of isocyanate groups to groups which are reactive with isocyanate groups within the range of 1:0.8 to 1:0 in the reaction mixture which is to be introduced into the mold.

4,317,792

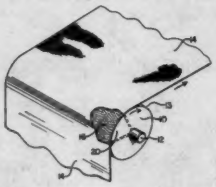
PROCESS FOR PRODUCING PERFORATED FILM

Garland E. Raley, and James M. Adams, both of Terre Haute, Ind., assignors to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 68,910, Aug. 23, 1979, Pat. No. 4,252,516, which is a division of Ser. No. 909,112, May 24, 1978, abandoned. This application Apr. 18, 1980, Ser. No. 141,326

Int. Cl.[3] B29C *17/14*

U.S. Cl. 264—504 5 Claims



1. A process for the manufacture of thermoplastic sheet having elliptical perforations comprising:

a. placing a thermoplastic sheet into contact with a continuously rotating molding element means having hexagonal-shaped depression means in which a series of elliptical hole means are centered, said hole means having a major axis and a minor axis, said major axis being oriented parallel to the direction in which said molding element means is rotating;

b. subjecting a surface of said thermoplastic sheet to the action of a fluid pressure differential to cause said sheet to flow into said elliptical hole means while maintaining said pressure differential to effect rupturing of said thermoplastic sheet and the formation of elliptical hole means in said sheet; and,

c. continuously removing the molded portions of said sheet from said molding element means.

4,317,793

PROCESS FOR THE PRODUCTION OF ORIENTED HOLLOW BODIES

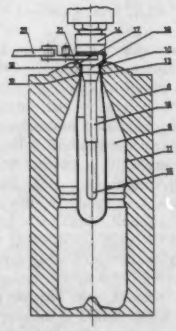
Guy Hubert, Lasne-Chapelle-Saint-Lambert, and Edmond Michel, Brussels, both of Belgium, assignors to Solvay & Cie, Brussels, Belgium

Continuation of Ser. No. 931,734, Aug. 7, 1978, abandoned. This application Aug. 14, 1980, Ser. No. 178,342

Claims priority, application France, Aug. 8, 1977, 77 24579

Int. Cl.[3] B29C *17/07*

U.S. Cl. 264—521 11 Claims



1. In a process for the production of an oriented hollow body of thermoplastic material provided with a neck finish composed of an upper molded part having an axially symmetrical outer surface and presenting an orifice collar and a lower molded part, by initially blow molding a hot tubular parison of thermoplastic material in a preform mold to produce a preform, conveying the preform from the preform mold to a final blow mold, thermally conditioning the resulting preform to a temperature capable of inducing orientation of the thermoplastic material during subsequent stretching, and finally blow molding the preform to produce the desired final hollow body, the improvement wherein said step of initially blow molding is carried out in a manner to give only the orifice collar its definitive form and to produce a false neck located above the orifice collar, said step of conveying is effected in a manner to allow the preform to assume any arbitrary orientation about its longitudinal axis during introduction into the final blow mold, and said step of finally blow molding is carried out in a manner to form the lower molded part of the neck finish below the orifice collar.

4,317,794

PROCESS FOR THE CONTINUOUS MANUFACTURE OF FIBER-REINFORCED CELLULOSE HYDRATE TUBING AND EQUIPMENT FOR CARRYING OUT THE PROCESSES

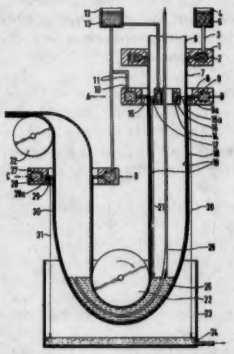
Herbert Gord, Ingelheim, and Reinhold Becker, Wiesbaden, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 2, 1979, Ser. No. 53,763

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1978, 2829102

Int. Cl.[3] B29D *7/20*

U.S. Cl. 264—559 13 Claims



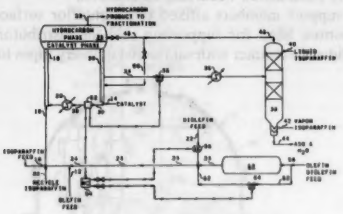
1. A process for the continuous manufacture of fiber-reinforced tubing based on cellulose hydrate, comprising the steps of impregnating and coating fibrous tubing with an aqueous alkaline viscose solution; moving the viscose-treated tubing at a steady speed vertically in a straight line along its longitudinal axis; applying a film of viscose-regenerating fluid along at least one circular circumferential line to at least the outside of the viscose-treated fibrous tubing; immediately after the application step, passing the tubing with the film of regenerating fluid on its surface through at least one first air section, whereby there is produced a fiber-reinforced tubing based on cellulose hydrate; treating the cellulose hydrate tubing with an aqueous fluid containing a dissolved chemical plasticizer; and drying the plasticized tubing.

4,317,795

CATALYTIC ALKYLATION OF HYDROCARBONS

Donald J. Makovec, and Donald M. Haskell, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 27,425, Apr. 5, 1979, Pat. No. 4,207,423.
This application Feb. 26, 1980, Ser. No. 124,994
Int. Cl.³ G01N *21/00*; G05D *7/00*
U.S. Cl. 422—62 **6 Claims**



1. Apparatus for producing a hydrocarbon alkylate product, comprising;

alkylation reactor means adapted to alkylate an alkylatable hydrocarbon with an alkylating agent in the presence of an acid-type catalyst;

separator-surge vessel means adapted to receive alkylation reactor effluent from said alkylation reactor and separate said effluent into an alkylate product phase and a recycled catalyst phase;

first conduit means for recycling said separated catalyst phase to said alkylation reactor;

cooling means in said first conduit means;

hydroisomerization reactor means;

second conduit means adapted to introduce an alkylating agent to said hydroisomerization means;

third conduit means adapted to receive effluent product from said hydroisomerization reactor and introduce said effluent to said alkylation reactor; and

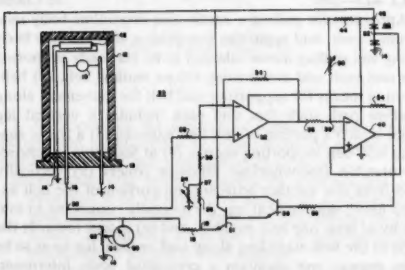
bypass conduit means adapted to at least periodicially bypass at least a portion of the alkylating agent around said hydroisomerization reactor and directly to said alkylation reactor.

4,317,796

EXPLOSIVE GAS DETECTOR

Thomas A. Barr, 4618 Panorama Dr., Huntsville, Ala. 35801

Continuation-in-part of Ser. No. 57,710, Jul. 16, 1979, Pat. No. 4,258,002. This application Mar. 23, 1981, Ser. No. 246,090
Int. Cl.³ G01N *27/16, 31/12*
U.S. Cl. 422—95 **2 Claims**



1. An explosive gas detector comprising:

a container having a gas entrance;

a source of D.C. power having a ground reference terminal, and including a full voltage terminal and a fractional voltage terminal;

impedance means positioned in said container, and having first and second terminals comprising;

a conductor having the characteristic of an increase in resistance with an increase in temperature,

a catalytic material coated on said conductor, which material increases in temperature in the presence of an explosive gas, and

said first terminal being connected to said reference terminal of said power source;

an electrical bridge comprising;

said impedance,

first and second resistors, each having first and second terminals,

a variable resistor having first and second terminals,

said first terminals of said first and second resistors being connected together as a bridge input terminal, said first terminals of said impedance element and variable resistor being coupled together to said ground reference terminal, and

said second terminals of said first resistor and impedance means being connected together as a first output terminal, and said second terminals of said second resistor and variable resistor being connected together as a second output terminal;

a transistor having its collector and emitter coupled in series between said full voltage terminal of said power source and said bridge input terminal and providing a power input to said bridge;

first amplification means comprising an operational amplifier having its input coupled across said output terminals of said bridge;

a container temperature responsive circuit comprising a thermistor positioned within said container, and a resistor connected in series with said thermistor between said reference terminal and one of said power terminals of said power source;

a summing circuit comprising:

a summing junction, and

a first input to said summing junction comprising a resistor connected from the output of said operational amplifier;

a second summing junction input comprising:

a temperature responsive resistor in said container,

a resistive load connected in series with said temperature responsive resistor and said source of D.C. power, and

a variable resistor connecting the voltage across said temperature responsive resistor to said summing junction;

a second operational amplifier, its inverting input being connected to said summing junction, and its non-inverting input being connected to said fractional voltage terminal of said power source;

drive means connected to the output of said second operational amplifier for applying a drive signal to the base of said transistor for controlling the impedance of said transistor as a direct function of current flow through said impedance means, whereby the voltage applied to said impedance means is decreased as a function of explosive gas in said catalytic material; and

indicating means responsive to voltage across said impedance means for indicating the quantity of gas present.

4,317,797

RESIN PURGER

Samuel C. Smith, Newton Centre, Mass., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 25, 1980, Ser. No. 181,272
Int. Cl.³ B01J *19/00, 19/14*
U.S. Cl. 422—119 **9 Claims**

1. Apparatus for purging atmospheric contaminants from a

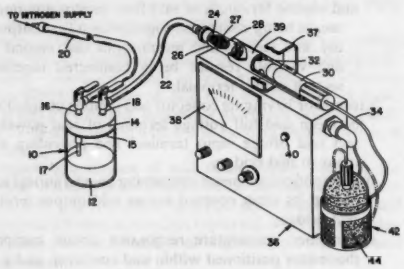
container in which a non-gaseous material is stored, which comprises:

(a) means for sealing a container in which a non-gaseous material is stored to form a sealed chamber holding said stored material and gaseous contaminants associated therewith;

(b) said means for sealing having an inlet valve having a first port communicating with said chamber and a second port, the opening of said inlet valve establishing communication between said first port and said second port and the closing of said inlet valve interrupting communication between said first port and said second port;

(c) said means for sealing having an outlet valve having a first port communicating with said chamber and a second port, the opening of said outlet valve establishing communication between said first port and said second port and the closing of said outlet valve interrupting communication between said first port and said second port;

(d) a source of a purge gas communicating with the second port of the inlet valve for supplying a stream of purge gas;



(e) means for filtering material residue from a gaseous material, the input of said means for filtering being coupled to the second port of said outlet valve;

(f) means for detecting the concentration of a contaminating gas in a gaseous material, said means for detecting coupled to the output of said means for filtering; and

(g) means for displaying when the concentration of said contaminating gas detected by said means for detecting is below a preselected concentration; whereby

the inlet valve may be opened to introduce a stream of purge gas into said chamber, the outlet valve may be opened to allow the gaseous contents of the chamber to be forced by the pressure of said stream of purge gas from the chamber and through the means for filtering and said means for detecting, and

the outlet valve and the inlet valve may be sequentially closed when said means for displaying indicates that the concentration of oxygen in the gaseous material forced from the chamber is below a preselected concentration to terminate purging at the optimum moment without allowing the contaminants to re-enter the chamber.

4,317,798

BOTTOM (COKER) BURNER VESSEL

Arthur C. Worley, Mt. Tabor, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jul. 30, 1980, Ser. No. 173,474

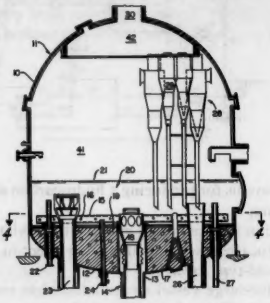
Int. Cl.[3] F27B *15/10;* **B01J** *8/44*

U.S. Cl. 422—144 **11 Claims**

1. A burner vessel for supplying heated particulate to a reactor vessel wherein the burner vessel comprises an exterior shell, including a top and bottom head, a plurality of outlets for removing at least exhaust gases from the vessel, a plurality of inlets for supplying air and steam to an interior portion of the burner, means within said burner vessel for separating particulate from exhaust gases and a fluidized coke particle bed for combusting particulate at elevated temperatures, the improvement including:

(a) an air distributor inlet, including; a central vertical header, a plurality of radial delivery pipes connected to said header, a plurality of concentric ring delivery pipes which are in turn connected to said radial delivery pipes, a plurality of nozzles in said concentric delivery pipes for delivering air or a mixture of air and steam from said header to said fluidized bed of the burner vessel to support the combustion occurring in said bed,

(b) support members affixed to an anterior surface of said bottom head for supporting said air distributor inlet in slideable contact with said radial delivery pipes to provide



freedom of movement for said radial delivery pipes and therefore said air distributor inlet during thermal expansion and contraction which occurs during the combustion in said burner vessel, said support members being surrounded by refractory fill disposed in said bottom head, said refractory fill in said bottom head being covered with a cast refractory layer and reinforced with a metallic mesh which prevents ingress of coke particles to the refractory fill below the cast refractory layer, and

(c) means defining a yieldable connection between said central vertical header and said bottom head to allow the vertical header to freely expand or contract axially with respect to said bottom head.

4,317,799

BELT-ROLLER CRYSTAL PULLING MECHANISM

John B. Serafino, Billerica, and William A. Kmetz, Marlboro, both of Mass., assignors to Mobil Tyco Solar Energy Corporation, Waltham, Mass.

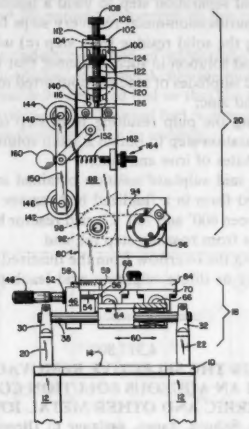
Continuation of Ser. No. 19,437, Mar. 12, 1979, abandoned. This application Mar. 30, 1981, Ser. No. 248,819

Int. Cl.[3] C30B *35/00*

U.S. Cl. 422—249 **16 Claims**

1. Apparatus for pulling a continuous crystalline body issuing from a melt, said apparatus comprising, a crystalline body gripping and pulling means adapted to be vertically supported above said melt and comprising: (1) an endless belt, (2) belt-supporting means for supporting said belt for movement along an endless path such that said path includes a vertical leg through which a portion of said belt extends, (3) a frame supporting said belt supporting means, (4) at least two independently-rotatable free-wheeling follower rollers (a) vertically spaced from one another adjacent the portion of the belt extending along said vertical leg, (b) pivotally connected to said frame by at least one link member, and (c) biased towards the portion of the belt extending along said vertical leg so as to be able to engage and maintain a crystalline body interposed between said belt and said rollers in contact with said belt, said rollers being movable between a first position wherein said rollers are spaced from said portion of the belt extending along said vertical leg and a second position wherein said rollers

engage the portion of the belt extending along said vertical leg, wherein said at least one link member forms an acute angle with said vertical leg when said rollers are in said second



position, and (5) drive means for operating said belt so that a crystalline body issuing from said melt and gripped by said crystalline body gripping and pulling means may be pulled upwards from said melt by movement of said belt.

4,317,800

PROCESS FOR SIMULTANEOUSLY PROCESSING OF USED METAL AND/OR METAL SCRAP AND SCRAP CONTAINING HALOGENATED HYDROCARBONS

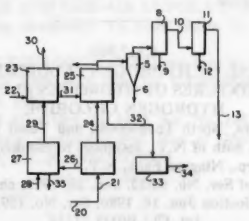
Wijtze Sloterdijk; Gerrit Dapper; Cornelis A. Verbraak, all of Enschede, and Willem Kirchner, Geleen, all of Netherlands, assignors to Esmil B.V., Amersfoort, Netherlands

Continuation-in-part of Ser. No. 948,646, Oct. 4, 1978, abandoned. This application Sep. 15, 1980, Ser. No. 187,406

Claims priority, application Netherlands, Oct. 5, 1977, 7710901

Int. Cl.³ C10B *47/00*; C01B *9/00*

U.S. Cl. 423—1 **13 Claims**



1. A process for the disposal of waste material containing halogenated hydrocarbon by pyrolysis in the absence of molecular oxygen by the combination of steps of:

introducing said waste halogenated hydrocarbon into a pyrolysis zone wherein it is heated to a temperature at least sufficient to form a pyrolysis zone off-gas containing halide substantially all in the form of gaseous hydrogen halide, and a pyrolysis zone residue;

introducing waste metal into a heating zone wherein it is heated to a halogenation temperature whereat at least one component of said waste metal will react with said hydrogen halide to form the corresponding metal halogenide;

contacting said heated waste metal in a halogenation zone, which is separate from said pyrolysis zone, with said hydrogen halide containing pyrolysis zone off-gas whereby at least a portion of said waste metal is converted into at least one metal halogenide which is vaporized under the temperature applied, thereby forming a metal halogenide containing gas;

separating metal halogenide by condensation from said metal halogenide containing gas leaving a residual gas stream; and

utilizing at least a portion of the fuel value of said halogenated hydrocarbon to provide heat to at least one of said zones;

wherein the composition, quantity, and temperature of said heated waste metal in said halogenation zone is chosen so as to convert substantially all of said gaseous hydrogen halide into metal halogenide.

4,317,801

RECOVERY OF MOLYBDENUM FROM SPENT CATALYST SOLUTIONS FROM HYDROPEROXIDE EPOXIDATIONS

Paul D. Taylor, Flemington, and Michael T. Mocella, East Windsor, both of N.J., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jan. 21, 1981, Ser. No. 226,968

Int. Cl.³ C01G *39/06*

U.S. Cl. 423—54 **3 Claims**

1. In the process of separating and recovering molybdenum from a spent catalyst solution which is the reaction product of a molybdenum catalyzed epoxidation of an olefin with an organic hydroperoxide after removal of product epoxide and the alcohol corresponding to the hydroperoxide, the improvement comprises removing and recovering dissolved molybdenum as a high molybdenum content solid by subjecting the spent catalyst solution to a liquid-to-liquid extraction with water to produce a two phase system, separating the molybdenum-rich aqueous extract and precipitating therefrom a high molybdenum content solid by heating the aqueous extract in the presence of hydrogen sulfide or a water soluble sulfide salt.

4,317,802

PROCESS FOR SEPARATING MOLYBDENUM AND/OR OTHER METALS CONTAINED IN RESIDUAL ORGANIC EFFLUENTS

Jacques Dugua, Charly, France, assignor to Metaux Speciaux, Paris, France

Filed Nov. 5, 1980, Ser. No. 204,340

Claims priority, application France, Nov. 27, 1979, 79 29610

Int. Cl.³ C01G *39/00*

U.S. Cl. 423—55 **4 Claims**

1. A process for separating molybdenum compounds contained in residual organic effluents from epoxidation of olefins with hydroperoxides, said process comprising:

(1) Combining the molybdenum containing effluent with from about 1% to about 10% by weight water;

(2) Heating the effluent and water mixture to a temperature of from about 150° C. to about 220° C. at a pressure of from about 10 bars to about 40 bars; and

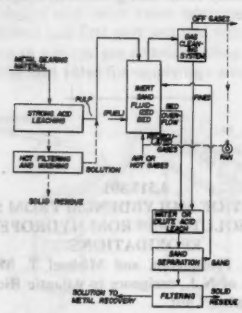
(3) Separating the solid phase.

4,317,803

RECOVERY OF NON-FERROUS METALS BY THERMAL TREATMENTS OF SOLUTIONS CONTAINING NON-FERROUS AND IRON SULPHATES

Igor A. E. Wilkomirsky; Roy S. Boorman, and Robert S. Salter, all of Fredericton, Canada, assignors to Provincial Holdings Ltd., New Brunswick, Canada

Continuation of Ser. No. 940,937, Sep. 11, 1978, Pat. No. 4,224,122. This application Sep. 22, 1980, Ser. No. 189,249
Claims priority, application Canada, May 5, 1978, 302719
The portion of the term of this patent subsequent to Jan. 13, 1998, has been disclaimed.
Int. Cl.³ C01G 9/06
U.S. Cl. 423—99 7 Claims



1. A method for recovering zinc from a strong sulphuric acid solution containing zinc and iron as sulphates or from zinc sulphide ores or concentrates comprising:

(a) roasting said sulphate or zinc sulphide ore or concentrate in a subdivided form in a fluidized bed reactor at a temperature from 600° to 750° C. with 20–150% excess air for an average retention time of 1–12 hours resulting in an atomsphere comprising SO_2, SO_3, water vapor and remaining O_2 and N_2 from the air, to obtain a calcine containing ferrite and sulphates, oxysulphates and oxides of zinc, plus hematite;

(b) leaching said calcine with water or dilute sulphuric acid solution in such a manner that the sulphates, oxysulphates, and oxides of zinc are leached out in part from the calcine into the water or dilute sulphuric acid solution;

(c) subjecting the leach pulp resulting from step (b) to a liquid-solid separation step to yield a leach solution suitable for purification-metal recovery steps for zinc;

(d) leaching the solid residue resulting from step (c) with strong sulphuric acid solution in such a manner that the ferrite and unreacted sulphides of zinc are converted to the sulphates of iron and zinc;

(e) recycling the pulp resulting from step (d) to a fluidized bed of inert solid particles at a temperature between 600° and 750° C. said bed being fluidized by off gas from roasting step (a); and

(f) subjecting the overflow from the fluidized bed in step (e) to a water or dilute sulfuric aicd leach to recover the zinc.

4. A method for recovering zinc from a strong sulphuric acid solution containing zinc and iron as sulphates or from zinc sulfide ores or concentrates, comprising:

(a) roasting said sulphate or zinc sulfide ore or concentrate in a subdivided from in a fluidized bed reactor at a temperature from 600° to 750° C. with a 20–150% excess air for an average retention time of 1–12 hours resulting in an atmoshere comprising SO_2, SO_3, water vapour and remaining O_2, and N_2 from the air, to obtain a calcine containing ferrite and sulphates, oxysulphates and oxides of zinc, plus hematite;

(b) leaching said calcine with water or dilute sulphuric acid solution in such a manner that the sulphates, oxysulphates, and oxides of zinc are leached out in part from the calcine into the water or dilute sulphuric acid solution;

(c) subjecting the leach pulp resulting from step (b) to a liquid-solid separation step to yield a leach solution suitable for purification-metal recovery steps for zinc;

(d) leaching the solid residue from step (c) with strong sulphuric acid solution in such a manner that the ferrite and unreacted sulphides of zinc are converted to the sulphates of iron and zinc;

(e) subjecting the pulp resulting from step (d) to a liquid-solid separation step to obtain a leach solution containing said sulphates of iron and zinc;

(f) roasting said sulphate solution obtained in step (e) in a subdivided form in a fluidized bed reactor at a temperature between 600° and 750° C., said reactor being fluidized by off gas from roasting step (a); and

(g) subjecting the overflow from the fluidized bed in step (f) to a water or dilute sulphuric acid leach to recover the zinc.

4,317,804

PROCESS FOR THE SELECTIVE REMOVAL OF FERRIC ION FROM AN AQUEOUS SOLUTION CONTAINING FERRIC AND OTHER METAL IONS

Michio Ichijo, Sakura, Japan, assignor to Director-General of Agency of Industrial Science and Technology, Tokyo, Japan

Filed Mar. 9, 1981, Ser. No. 241,635
Claims priority, application Japan, Jun. 26, 1980, 55/87078
Int. Cl.³ C01G 49/02
U.S. Cl. 423—139 11 Claims

1. A process for treating a ferric ion-containing aqueous solution for the removal of ferric ion, comprising the steps of:

(a) contacting the ferric ion-containing aqueous solution with an organic extractant comprising a dialkylphosphoric acid having 6 to 12 carbon atoms and a hydrocarbon solvent to extract the ferric ion therefrom, thereby obtaining an organic phase containing the extracted ferric component and an aqueous phase containing residual unextracted ferric ion;

(b) separating said aqueous phase from said organic phase;

(c) mixing said aqueous phase with a pH-controlling agent to increase the pH thereof to a value sufficient to precipitate at least a part of the residual ferric ion as ferric hydroxide; and

(d) separating the mixture from step (c) into a solid phase and a liquid phase.

4,317,805

REMOVAL OF HYDROGEN FLUORIDE FROM GASEOUS MIXTURES OF HYDROGEN FLUORIDE AND HYDROGEN CHLORIDE

Stephen Robota, North Tonawanda, and Yusuf A. Baxamusa, Tonawanda, both of N.Y., assignors to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Continuation of Ser. No. 6,615, Jan. 25, 1979, abandoned. This application Jun. 16, 1980, Ser. No. 159,751
Int. Cl.³ B01D 53/34
U.S. Cl. 423—240 4 Claims

1. A method of continuously removing hydrogen fluoride from a gaseous mixture containing up to about 5 percent by weight hydrogen fluoride which comprises the steps of:

(a) contacting said initial gas mixture with a first bed of particulate, substantially anhydrous, alkaline earth metal chloride material to produce an effluent gas mixture having a hydrogen fluoride content substantially less than that of the initial gas mixture.

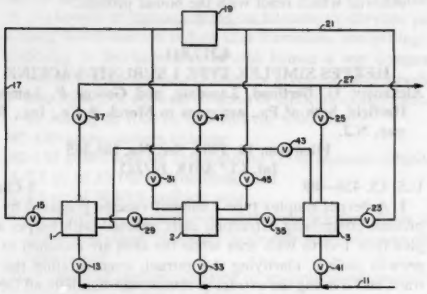
(b) controlling the temperature of said effluent gas within the range of about −20° and about +20° C.,

(c) contacting said effluent gas with a secondary bed of particulate, substantially anhydrous, alkaline earth metal chloride material maintained at a temperature between

about −20° and about +20° C. to produce a gas mixture containing less than 20 ppm hydrogen fluoride,

(d) carrying out said contact in step (a) until said alkali earth metal chloride material in said bed is partially depleted by being about 50 percent converted to the corresponding fluoride,

(e) placing a replacement bed of particulate, substantially anhydrous, alkaline earth metal chloride material in series with said partially depleted bed so that the gaseous effluent from said partially depleted bed is directed to contact said replacement bed prior to cooling,



(f) carrying out the contact in step (e) until the alkaline earth metal chloride material in said partially depleted bed is at least about 80 percent converted to corresponding fluoride,

(g) removing said depleted bed from contact with the gas mixture by directing the gas mixture to solely contact said replacement bed,

(h) carrying out said contact in step (g) until said replacement bed is about 50 percent converted to the corresponding fluoride, and

(i) repeating steps (e), (f), (g) and (h).

4,317,806

METHOD AND APPARATUS FOR DEDUSTING AND ABSORPTION OF CONTAMINATING GASES BEING THE EXHAUST GASES OF WASTE-INCINERATING DEVICES AND HOT-AIR CUPOLA FURNACES

Lutz Leisegang, Brahmsstr. 13, 1000 Berlin 33, Fed. Rep. of Germany

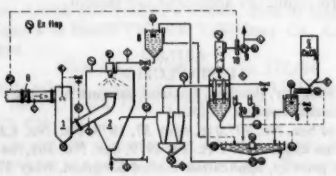
PCT No. PCT/DE79/00128, § 371 Date Jun. 23, 1980, § 102(e) Date Jun. 23, 1980, PCT Pub. No. WO80/00797, PCT Pub. Date May 1, 1980

PCT Filed Oct. 23, 1979, Ser. No. 194,292

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1978, 2846357; Jul. 20, 1979, 2929974

Int. Cl.³ C01B *17/00*

U.S. Cl. 423—242 **10 Claims**



1. A method of exhaust gas dedusting and absorption of contaminating gases characterized by the following method steps:

1. prededusting and cooling of the gas by means of evaporating fresh water,

2. superfine atomizing of mud containing circulation scrubbing water for further cooling and mud drying,

2.1 extracting the dried waste mud,

3. precipitation by centrifugal force of the major portion of the dust from the cooled gas,

3.1 extracting the precipitated dust,

4. cooling of the gas up to the saturation point by means of fresh water,

5. scrubbing of the gas for removal of contaminating gas,

5.1 discharge of the scrubbing liquid,

5.2 neutralization of the scrubbing liquid,

5.3 discharge of the clarified scrubbing liquid,

6. wet-precipitation of the residual dust from the gas.

4,317,807

AIR COOLING DURING THE PRODUCTION OF PHOSPHORIC ACID

Jean-Francois Gielly, Rouen; Dominique Lizee, Pelussin, and Bernard Sohier, Rouen, all of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Jun. 12, 1980, Ser. No. 158,707

Claims priority, application France, Sep. 26, 1979, 79 23895

Int. Cl.³ C01B *25/16*; B01D *53/34*

U.S. Cl. 423—320 **23 Claims**

1. In a process for the control of the exothermic heat of reaction generated during the production of wet-process phosphoric acid in an exothermal reaction system and including blowing a stream of cooling air onto and over the surface of an exothermal reaction medium that is the digestion reaction of phosphate rock with sulfuric acid confined within an exothermal reaction zone and therein entraining the vapors and off-gases evolved from such exothermal reaction medium, the improvement which comprises (i) establishing a continuous cooling air recirculation loop and continuously recycling the cooling air therethrough, repeatedly onto and over the surface of said exothermal reaction medium, said continuous air recirculation loop including an internal segment within said reaction zone and comprising the surface of any exothermal reaction medium contained therein, and an external segment to complete the loop exterior of said reaction zone and recycling from thus defined reaction zone outlet to reaction zone inlet; (ii) separating at least a portion of said entrained vapors and off-gases from said recirculating cooling air at a given point along said external segment; (iii) discharging a minor amount of the recirculating cooling air from said external segment of the loop at a point downstream from said separation (ii); and (iv) introducing a minor amount of fresh cooling air into the loop, either into said external segment thereof at any point downstream from the discharge (iii), or into said internal segment itself.

4,317,808

PROCESS FOR THE PRODUCTION OF HYDROGEN CYANIDE

Carl Voigt, Rodenbach; Hans Strack, Alzenau, and Peter Kleinschmit, Hanau, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 18, 1980, Ser. No. 208,026

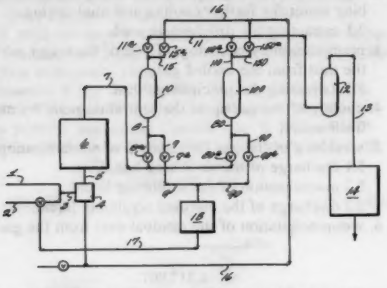
Claims priority, application Fed. Rep. of Germany, Nov. 24, 1979, 2947498

Int. Cl.³ C01C *3/02*

U.S. Cl. 423—375 **25 Claims**

1. In a process for the production of hydrogen cyanide in a reaction furnace according to the BMA process, or a process identical to the BMA process except that a hydrocarbon other than methane is employed, the improvement comprising bringing the product gas leaving the reaction furnace and consisting essentially of hydrogen cyanide, hydrogen, unreacted hydro-

carbon and ammonia as well as small amounts of nitrogen and carbon monoxide and optionally water into contact with a



zeolite to adsorb ammonia and recovering the adsorbed ammonia by desorption.

4,317,809

CARBON FIBER PRODUCTION USING HIGH PRESSURE TREATMENT OF A PRECURSOR MATERIAL

Irwin C. Lewis, Strongsville, and Arthur W. Moore, North Olmsted, both of Ohio, assignors to Union Carbide Corporation, New York, N.Y.

Filed Oct. 22, 1979, Ser. No. 87,186
Int. Cl.³ D01F 9/14; C10C 3/00
U.S. Cl. 423—447.1 **36 Claims**

1. A process for producing a carbon fiber, comprising the steps of:

subjecting a precursor material selected from the group consisting of ethylene tar, ethylene tar distillate, and gas oil to a thermal-pressure treatment as a batch treatment for a temperature range from about 400° C. to about 475° C. and for a pressure from about 200 psig to about 1500 psig;

thereafter, subjecting the precursor material to heating under atmospheric pressure while sparging with an inert gas to form a mesophase pitch;

spinning the mesophase pitch into at least one pitch fiber; and

converting the pitch fiber into the carbon fiber.

4,317,810

WAFFLE-LIKE MATRIX FOR IMMUNOASSAY AND PREPARATION THEREOF

Seymour P. Halbert, Miami, and Milton Anken, N. Miami Beach, both of Fla., assignors to Cordis Laboratories, Inc., Miami, Fla.

Continuation of Ser. No. 617,746, Sep. 29, 1975, abandoned. This application Mar. 2, 1980, Ser. No. 126,525
The portion of the term of this patent subsequent to Jun. 5, 1996, has been disclaimed.
Int. Cl.³ G01N 31/06, 33/48, 33/52, 33/54
U.S. Cl. 424—12 **10 Claims**

1. A material for use in immunoassay comprising a water insoluble polymeric matrix having a layer of reactive groups grafted into its surface, said reactive groups being capable of covalently bonding to protein to enable the structure to be used in immunoassay wherein the improvement comprises a designed configuration of top and bottom waffle-like surfaces having a plurality of ridges and depressions on said polymeric matrix which, when placed in a flat bottom vial, both top and bottom surfaces will be substantially in contact with any solution in the vial while minimizing the surface to surface contact between the matrix and the bottom of the vial.

6. A method for producing a material useful in immunoassay comprising:

(a) providing a disc shaped polymeric matrix which has groups reactive with proteins grafted onto its opposed surfaces;

(b) distorting the opposed surfaces on said reactive groups with a designed configuration in the form of a plurality of ridges and depressions without puncturing the disc so that when said matrix is placed in the bottom of a vial both surfaces will be substantially in complete contact with any solution in the vial and there will be a minimum of surface-to-surface contact between the matrix and the bottom of the vial;

(c) covalently bonding a protein onto the reactive groups to enable the material to be utilized in assaying the presence of material which react with the bound protein.

4,317,811

HERPES SIMPLEX TYPE 1 SUBUNIT VACCINE

Alexander U. Bertland, Lansdale, and George P. Lampson, Hatfield, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Sep. 11, 1980, Ser. No. 186,365
Int. Cl.³ A61K 39/245
U.S. Cl. 424—89 **9 Claims**

1. A herpes simplex type 1 subunit vaccine prepared by the process comprising extracting cells infected with herpes simplex type 1 virus with urea while the cells are attached to the growth surface, clarifying the extract, concentrating the extract, and treating the extract to remove substantially all DNA.

4,317,812

POLYNITROXIN ANTIBIOTICS PRODUCED BY *NOCARDIOPSIS MUTABILIS* SHEARER SP. NOV. ATCC 31520

Tikam C. Jain, King of Prussia, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Filed Jan. 15, 1981, Ser. No. 225,156
Int. Cl.³ A61K 35/00
U.S. Cl. 424—116 **9 Claims**

1. A polynitroxin antibiotic which in the form of the hydrochloride salt is characterized as follows:

(a) a melting point of 255°–258° C. (dec.);

(b) an approximate elemental composition of 33.32 percent carbon, 6.22 percent hydrogen, 21.49 percent nitrogen and 15.81 percent chlorine;

(c) an infrared absorption spectrum in potassium bromide which exhibits peaks at the following wavenumbers in cm^{-1}: 3226, 1667, 1538, 1493 and 1227 as shown in FIG. 1;

(d) a nuclear magnetic resonance spectrum (Fourier Transform) in deuterium oxide which exhibits the following chemical shifts in ppm: 8.3, 5.55, 5.2, 4.65 (m), 4.1 (t), 3.65 (d), 3.35, 3.05 and 2.1 as shown in FIG. 2;

(e) an ultraviolet absorption spectrum in water which exhibits an absorption maximum at 267 nm and an absorption minimum at 230 nm as shown in FIG. 3;

(f) a specific rotation $[\alpha]_D^{25} = -22.2°$ (C, 1.0 in H_2O); and

(g) positive reactions with ninhydrin, molybdate, and permanganate and a negative reaction with periodate

or a pharmaceutically acceptable salt thereof.

4,317,813

DISINFECTION

John W. Ridgway, Reading, England, assignor to Interox Chemicals Limted, London, England

Division of Ser. No. 907,018, May 17, 1978, Pat. No. 4,239,622. This application Dec. 10, 1979, Ser. No. 101,764
Claims priority, application United Kingdom, May 27, 1977, 22599/77
Int. Cl.³ A01N 59/00
U.S. Cl. 424—130 **2 Claims**

1. A composition for disinfecting a water supply consisting essentially of an aqueous solution of monochloroamine and

hydrogen peroxide, the weight ratio of hydrogen peroxide to monochloroamine being from 2:1 to 20:1.

4,317,814

PREPARATION AND METHOD FOR TREATING BURNS

Felipe Laso, Montecito 59, Mexico City DF, Mexico

Filed Jun. 12, 1980, Ser. No. 158,650

The portion of the term of this patent subsequent to Oct. 20, 1998, has been disclaimed.

Int. Cl.[3] A61K *33/40, 33/22, 33/20, 31/175*

U.S. Cl. 424—130 9 Claims

1. A method of treating burns on humans to alleviate pain resulting therefrom and reduce scar formation, comprising:

applying to the burn area of said human a wet compress containing an aqueous mixture of glycerine, and a perborate stabilized aqueous solution of chlorine oxides formed by adding to 1000 cc of water the following:

80–120 grams sodium chlorite

90–130 grams sodium hypochlorite (13% aqueous solution)

5–7.5 cc of 37.7% hydrochloric acid

2–4.5 cc of 98.15% sulfuric acid

4–12 grams of an inorganic perborate selected from the group consisting of sodium perborate and potassium perborate, and

8–15 grams of sodium peroxide or an equivalent amount of potassium peroxide, hydrogen peroxide, potassium percarbonate or sodium percarbonate.

4,317,815

LH-RH ANTAGONISTS

David H. Coy, 4319 Perrier St., New Orleans, La. 70115, and Andrew V. Schally, 5025 Kawanee Ave., Metairie, La. 70002

Filed Jun. 2, 1980, Ser. No. 155,249

Claims priority, application Canada, Jun. 13, 1979, 329643

Int. Cl.[3] A61K *37/00;* C07C *103/52*

U.S. Cl. 424—177 15 Claims

1. A compound of formula I

$$X\text{-}R^1\text{-}R^2\text{-}R^3\text{-Ser-Tyr-}R^4\text{-Leu-Arg-Pro-}R^5\text{-}NH_2 \quad (I)$$

in which X is hydrogen, lower alkanoyl, HOOC—$(CH_2)_n$—CO wherein n is an integer from 2 to 6, benzoyl or the acyl portion of a D- or L- amino acid; R^1 is D-Trp, D-Phe or D-p-halo-Phe; R^2 is D-p-halo-Phe; R^3 is D-Trp; R^4 is D-Trp or D-Phe; and R^5 is Gly or D-Ala; or a therapeutically acceptable salt thereof.

4,317,816

SAPONIN CONTAINING COMPOSITION EFFECTIVE AGAINST ADRENAL ATROPHY

Shigeru Arichi, and Yoshihiro Uchida, both of Osaka, Japan, assignors to Osaka Chemical Laboratory Co., Ltd., Osaka, Japan

Filed Jul. 24, 1980, Ser. No. 172,006

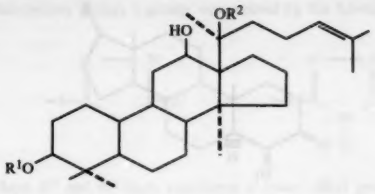
Claims priority, application Japan, Aug. 13, 1979, 54-103336

Int. Cl.[3] A61K *31/705;* A01N *31/00;* A61K *31/56*

U.S. Cl. 424—182 26 Claims

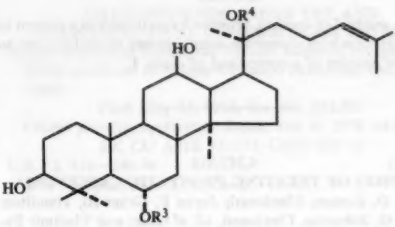
15. A method of preventing adrenal atrophy comprising administering to a patient a therapeutically effective amount of a saponin of medicinal ginseng.

26. A method according to claim 15, wherein said saponin contains a compound selected from the group consisting of a compound of formula I:



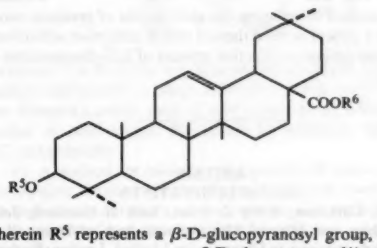
(I)

wherein R^1 represents a β-D-glucopyranosyl(1→2)-β-D-glucopyranosyl group, and R^2 represents a β-D-glucopyranosyl(1→6)-β-D-glucopyranosyl,β-L-arabinopyranosyl(1→6)-β-D-glucopyranosyl,β-D-xylopyranosyl(1→6)-β-D-glucopyranosyl,α-L-arabinofuranosyl(1→6)-β-D-glucopyranosyl or β-D-glucopyranosyl group, a compound of formula II:



(II)

wherein R^3 represents an α-L-rhamnopyranosyl(1→2)-β-D-glucopyranosyl,β-D-glucopyranosyl(1→2)-β-D-glucopyranosyl,β-D-glucopyranosyl or α-L-rhamnopyranosyl(1→2)-β-D-glucopyranosyl group, and R^4 represents a hydrogen atom or a β-D-glucopyranosyl group, a compound of formula III:



(III)

wherein R^5 represents a β-D-glucopyranosyl group, and R^6 represents a β-D-glucopyranosyl(1→2)-β-D-glucuronopyranosyl group, and mixtures thereof.

4,317,817

NOVEL STEROID 5α-REDUCTASE INHIBITORS

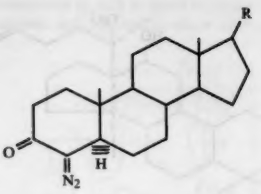
Thomas R. Blohm, Cincinnati, and Brian W. Metcalf, Mason, both of Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.

Continuation-in-part of Ser. No. 69,741, Aug. 27, 1979, abandoned, which is a continuation-in-part of Ser. No. 35,357, May 2, 1979, abandoned. This application Dec. 15, 1980, Ser. No. 216,112

Int. Cl.[3] A01N *47/08;* A61K *31/655*

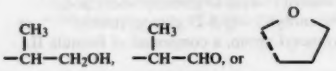
U.S. Cl. 424—226 16 Claims

1. A compound of the formula:



wherein R is:

=O, —OH, —OCO—alkyl C_{1-5}, $-CH_2OH$, —CHO, $-COCH_3$,



12. A method of treating prostate hypertrophy in a patient in need thereof which comprises administering to said patient an effective amount of a compound of claim 1.

4,317,818

METHOD OF TREATING PROSTATIC CARCINOMA

Harvey D. Benson, Cincinnati; Joyce F. Grunwell, Hamilton; John O. Johnston, Cincinnati, all of Ohio, and Vladimir Petrow, Chapel Hill, N.C., assignors to Richardson-Merrell Inc., Wilton, Conn.

Continuation of Ser. No. 32,828, Apr. 24, 1979, abandoned, which is a continuation of Ser. No. 841,892, Oct. 13, 1977, abandoned, which is a continuation-in-part of Ser. No. 684,946, May 10, 1976, abandoned. This application May 28, 1980, Ser. No. 154,175

Int. Cl.³ A61K *31/56*

U.S. Cl. 424—242 **6 Claims**

1. A method of reducing the growth rate of prostatic carcinoma in a patient in need thereof which comprises administering to said patient an effective amount of 3,17-dioxoandrost-4-en-19-al.

4,317,819

AMINE DERIVATIVES

John W. Clitherow; Barry J. Price, both of Hertford; John Bradshaw, and Michael Martin-Smith, both of Ware, all of England, assignors to Glaxo Group Limited, London, England

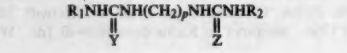
Division of Ser. No. 95,065, Nov. 16, 1979, Pat. No. 4,264,614. This application Dec. 5, 1980, Ser. No. 213,680

Claims priority, application United Kingdom, Nov. 16, 1978, 44777/78

Int. Cl.³ A61K *31/155, 31/17*; C07C *127/17, 129/12*

U.S. Cl. 424—244 **15 Claims**

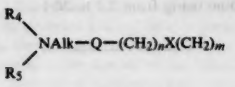
1. Compounds of the general formula (I)



(I)

or a physiologically acceptable salt or hydrate thereof, in which

Y and Z, which may be the same or different, each represent oxygen, sulphur, $=CHNO_2$ or $=NR_3$ where R_3 is hydrogen, nitro, cyano, lower alkyl, aryl, alkylsulphonyl or arylsulphonyl; p has a value from 2 to 12; R_1 represents



in which

R_4 and R_5, which may be the same or different each represent hydrogen, lower alkyl, cycloalkyl, lower alkenyl, aralkyl or lower alkyl interrupted by an oxygen atom or a group $>N-R_6$ in which R_6 represents hydrogen or lower alkyl, or R_4 and R_5 together with the nitrogen atom to which they are attached form a 5 to 7-membered saturated alkyleneimine ring; Q represents a benzene ring in which incorporation into the rest of the molecule is through bonds at the 1 and 3 or 1 and 4 positions;

X represents $—CH_2—$, —O— or —S—;

n represents zero or 1;

m represents 2, 3 or 4; and

Alk represents a straight chain alkylene group of 1 to 3 carbon atoms;

and R_2 represents lower alkyl or the group

$$—(CH_2)_yE(CH_2)_xG$$

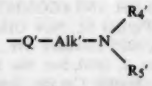
in which

y represents 2, 3 or 4, or can additionally represent zero or 1 when E is a $—CH_2—$ group;

x represents zero, 1 or 2;

E represents $—CH_2—$, —O— or —S—; and

G represents a monocyclic 5 or 6 membered carbocyclic aromatic ring, or a thiophen or furan ring, or G represents the group



where Q′ represents a thiophen ring in which incorporation into the rest of the molecule is through bonds at the 2- and 5-positions, or a benzene ring in which incorporation into the rest of the molecule is through bonds at the 1 and 3 or 1 and 4 positions; Alk′ represents any of the groups defined for Alk; and R_4' and R_5', which may be the same or different, represent any of the groups defined for R_4 or R_5.

15. A method of treating a condition mediated through histamine H_2-receptors which comprises administering to a patient an effective amount of a compound as defined in claim 1 to relieve said condition.

4,317,820

β-LACTAM SERIES COMPOUND AND ANTIBACTERIAL PHARMACEUTICAL COMPOSITION CONTAINING THE SAME

Hiroshi Ishikawa; Fujio Tabusa, and Kazuyuki Nakagawa, all of Tokushima, Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Apr. 10, 1979, Ser. No. 28,770

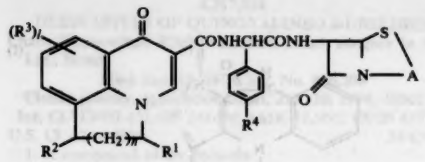
Claims priority, application Japan, Apr. 12, 1978, 53-43624; Sep. 7, 1978, 53-110464; Nov. 16, 1978, 53-141785; Nov. 24, 1978, 53-145638

Int. Cl.³ A61K *31/545*; C07D *499/70, 501/32*

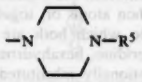
U.S. Cl. 424—246 **32 Claims**

1. A β-lactam series compound represented by the formula (I):

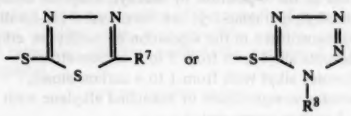
(I)



wherein R^1 represents a hydrogen atom or a lower alkyl group; R^2 represents a hydrogen atom; R^3 represents a halogen atom, a nitro group, an amino group, a hydroxy group, a lower alkyl group, a lower alkoxy group, a lower alkanoylamino group, a lower alkanesulfonyloxy group or a group represented by the formula



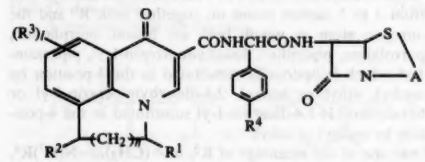
where R^5 represents a hydrogen atom, a lower alkanoyl group, or a lower alkanesulfonyl group; R^4 represents a hydrogen atom or a hydroxy group; n is an integer of 0 or 1; l is 0, 1 or 2; and A represents $-C(CH_3)_2CH(COOH)-$ or $-CH_2C(CH_2R^6)=C(COOH)-$ where R^6 represents a lower alkanoyloxy group, a group represented by the formula



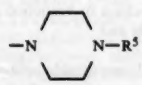
where R^7 and R^8 each represents a lower alkyl group, and when n is 0, R^1 and R^2 can combine to form a cyclohexane ring together with the carbon atoms to which they are attached, and pharmaceutically acceptable salts.

32. A pharmaceutical preparation having anti-bacterial effects, containing a pharmaceutically acceptable carrier and a therapeutically effective amount of a compound of the formula (I):

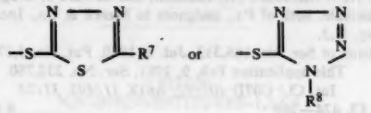
(I)



wherein R^1 represents a hydrogen atom or a lower alkyl group; R^2 represents a hydrogen atom; R^3 represents a halogen atom, a nitro group, an amino group, a hydroxy group, a lower alkyl group, a lower alkoxy group, a lower alkanoylamino group, a lower alkanesulfonyloxy group or a group represented by the formula



wherein R^5 represents a hydrogen atom, a lower alkanoyl group, or a lower alkanesulfonyl group; R^4 represents a hydrogen atom or a hydroxy group; n is an integer of 0 or 1; l is 0, 1 or 2; and A represents $-C(CH_3)_2CH(COOH)-$ or $-CH_2C(CH_2R^6)=C(COOH)-$ where R^6 represents a lower alkanoyloxy group, a group represented by the formula



where R^7 and R^8 each represents a lower alkyl group, and when n is 0, R^1 and R^2 can combine to form a cyclohexane ring together with the carbon atoms to which they are attached, and pharmaceutically acceptable salts.

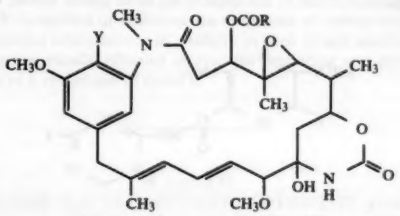
4,317,821

MAYTANSINOIDS, THEIR USE AND PHARMACEUTICAL COMPOSITIONS THEREOF

Osamu Miyashita, Osaka, and Hiroshi Akimoto, Hyogo, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

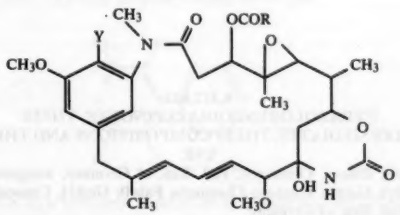
Filed May 22, 1980, Ser. No. 152,392
Claims priority, application Japan, Jun. 8, 1979, 54/72811
Int. Cl.³ A61K *31/535*; C07D *498/18*
U.S. Cl. 424—248.54 **12 Claims**

1. A compound of the formula:



wherein Y is H or Cl, and R is phenyl-C_{1-4}alkyl, pyridyl-C_{1-4}alkyl, imidazolyl-C_{1-4}alkyl, indolyl-C_{1-4}alkyl, furyl-C_{1-4}alkyl or thienyl-C_{1-4}alkyl, each of said groups being substituted at either or both α- and β-positions by hydroxyl, halogen or C_{1-5}alkanoyloxy.

12. A method for inhibiting the growth of tumor cells and prolonging the survival time of a tumor-bearing warm-blooded animal which comprises administering to said animal an effective amount of a compound of the formula:



wherein Y is H or Cl, and R is phenyl-C_{1-4}alkyl, pyridyl-C_{1-4}alkyl, imidazolyl-C_{1-4}alkyl, indolyl-C_{1-4}alkyl, furyl-C_{1-4}alkyl or thienyl-C_{1-4}alkyl, each of said groups being substituted at either or both α- and β-positions by hydroxyl, halogen or C_{1-5}alkanoyloxy.

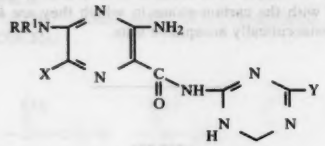
4,317,822

3-AMINO-5-SUBSTITUTED-6-HALO-N-(3,4-DIHYDRO-6-SUBSTITUTED-1,3,5-TRIAZIN-2-yl)2-PYRAZINECARBOXAMIDES

Otto W. Woltersdorf, Jr., Chalfont, and Edward J. Cragoe, Jr., Lansdale, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 165,312, Jul. 2, 1980, Pat. No. 4,277,602.
This application Feb. 9, 1981, Ser. No. 232,750
Int. Cl.[3] C07D *403/12;* A61K *31/495, 31/53*
U.S. Cl. 424—249 5 Claims

1. A compound of the formula:



wherein

R is hydrogen, C_{1-5} alkyl, C_{2-5} alkenyl or C_{3-6} cycloalkyl;

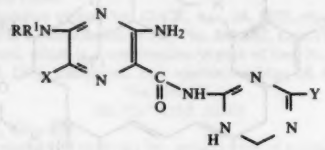
R^1 is hydrogen, C_{1-5} alkyl, C_{2-5} alkenyl or C_{3-6} cycloalkyl;

X is halo;

Y is NHR^2 wherein R^2 is C_{1-5} lower alkyl,

the pharmaceutically acceptable acid addition salts thereof and the tautomeric forms thereof.

4. A method of treating edema and hypertension which comprises administering to a patient in need of such treatment a pharmaceutically effective dose of a compound of the formula:



wherein

R is hydrogen, C_{1-5} alkyl, C_{2-5} alkenyl or C_{3-6} cycloalkyl;

R^1 is hydrogen, C_{1-5} alkyl, C_{2-5} alkenyl or C_{3-6} cycloalkyl;

X is halo;

Y is hydroxy or NHR^2 wherein R^2 is C_{1-5} lower alkyl,

the pharmaceutically acceptable acid addition salts thereof and the tautomeric forms thereof.

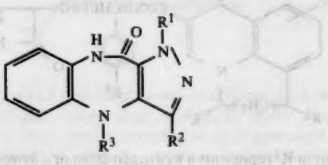
4,317,823

PYRAZOLOBENZODIAZEPINONES, THEIR INTERMEDIATES, THEIR COMPOSITIONS AND THEIR USE

Georg Rainer, Constance, Fed. Rep. of Germany, assignor to Byk Gulden Lomberg Chemische Fabrik GmbH, Constance, Fed. Rep. of Germany

Filed Aug. 4, 1980, Ser. No. 175,245
Claims priority, application Switzerland, Aug. 3, 1979, 7128/79; Aug. 10, 1979, 7333/79; Apr. 23, 1980, 3149/80
Int. Cl.[3] A61K *31/55;* C07D *487/04;* A61K *31/415*
U.S. Cl. 424—248.54 15 Claims

1. A pyrazolobenzodiazepinone of the formula



(I)

wherein

R^1 denotes alkyl with from 1 to 4 carbon atoms,

R^2 denotes —H or alkyl with from 1 to 4 carbon atoms,

R^3 denotes —H or —CO—A—R^4,

R^4 denotes halo or —N(R^5) R^6,

R^5 denotes alkyl with from 1 to 4 carbon atoms, alkenyl with from 3 to 5 carbon atoms or, together with R^6 and the nitrogen atom to which both are bound, morpholino, pyrrolidino, piperidino, hexahydroazepin-1-yl, piperazin-1-yl which is optionally substituted in the 4-position by methyl, ethyl or benzyl, 2,4-dimethylpiperazin-1-yl or hexahydro-1H-1,4-diazepin-1-yl substituted in the 4-position by methyl or ethyl,

R^6 has one of the meanings of R^5, is —$(CH_2)_m$—N(R^7)R^8 or, together with R^5 and the nitrogen atom to which both are bound, morpholino, pyrrolidino, piperidino, hexahydroazepin-1-yl, piperazin-1-yl which is optionally substituted in the 4-position by methyl, ethyl or benzyl, 2,4-dimethylpiperazine-1-yl or hexahydro-1H-1,4-diazepin-1-yl substituted in the 4-position by methyl or ethyl,

R^7 denotes alkyl with from 1 to 4 carbon atoms,

R^8 denotes alkyl with from 1 to 4 carbon atoms,

A denotes straight-chain or branched alkylene with from 1 to 5 carbon atoms and

m denotes 2 or 3,

or an acid-addition salt thereof.

11. A pyrazolobenzodiazepinone according to claim 1 wherein

R^1 denotes alkyl with from 1 to 4 carbon atoms,

R^2 denotes a hydrogen atom (—H) or alkyl with from 1 to 4 carbon atoms,

R^3 denotes —CO—A—R^4,

R^4 denotes —N(R^5)R^6,

R^5 denotes alkyl with from 1 to 4 carbon atoms, alkenyl with from 3 to 5 carbon atoms or, together with R^6 and the nitrogen atom to which both are bound, morpholino, pyrrolidino, piperidino, hexahydroazepin-1-yl, piperazin-1-yl which is optionally substituted in the 4-position by methyl, ethyl or benzyl, 2,4-dimethylpiperazin-1-yl or hexahydro-1H-1,4-diazepin-1-yl substituted in the 4-position by methyl or ethyl,

R^6 has one of the meanings of R^5, is —$(CH_2)_m$—N(R^7)R^8, or, together with R^5 and the nitrogen atom to which both are bound, is morpholino, pyrrolidino, piperidino, hexahydroazepin-1-yl, piperazin-1-yl which is optionally substituted in the 4-position by methyl, ethyl or benzyl, 2,4-dimethylpiperazin-1-yl or hexahydro-1H-1,4-diazepin-1-yl substituted in the 4-position by methyl or ethyl,

R^7 denotes alkyl with from 1 to 4 carbon atoms,

R^8 denotes alkyl with from 1 to 4 carbon atoms,

A denotes straight-chain or branched alkylene with from 1 to 5 carbon atoms and

m denotes 2 or 3,

or a pharmacologically-acceptable acid-addition salt thereof.

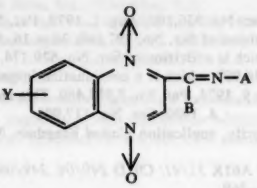
15. A method of preventing, reducing the severity of or treating stomach or intestinal disorders which comprises administering an effective amount of a compound according to claim 11 to a mammal prone to or afflicted with such disorders.

4,317,824
DERIVATIVES OF QUINOXALINE-1,4-DIOXIDES

Chaim Simonovitch, Rischon Letzion, Israel, assignor to Abic, Ltd., Israel

Filed Jun. 13, 1977, Ser. No. 806,303
Claims priority, application Israel, Jun. 24, 1976, 49902
Int. Cl.[3] C07D *401/06, 241/44;* A61K *31/495;* C07D *417/06*
U.S. Cl. 424—250 24 Claims

1. A compound of the formula:



in which Y stands for at least one hydrogen or halogen atom, or a straight or branched chain lower alkyl or lower alkoxy;

A stands for hydroxy;

and B stands either for (a) chlorine, or for (b) OR', with R' standing for straight or branched chain lower alkyl, and when B stands for chlorine then A may stand also for OOC—R, with R standing for straight or branched chain alkyl or halogen substituted alkyl radical or phenyl or phenyl substituted by one or more nitro groups.

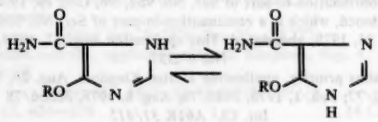
5. Method for the promotion of the growth of animals which comprises administering a compatible carrier carrying a growth promoting effective amount of a compound of claim 1 to the animal.

4,317,825
ANTITUMOR AND IMMUNOSUPPRESSIVE 4-CARBAMOYL IMIDAZOLIUM-5-OLATE DERIVATIVES

Toshio Atsumi, Kawanishi; Tetsutaro Sanjiki, Ibaraki, and Takao Kiyohara, Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Aug. 5, 1980, Ser. No. 175,688
Claims priority, application Japan, Aug. 8, 1979, 54-101684; Apr. 4, 1980, 55-45042
Int. Cl.[3] A61K *31/415, 31/495;* C07D *409/12, 405/12*
U.S. Cl. 424—250 23 Claims

1. A compound of the formula



wherein R is a substituted or unsubstituted five to six membered heteroaroyl group selected from the group consisting of furancarbonyl, thiophenecarbonyl, pyrrolecarbonyl, pyridinecarbonyl, pyridinecarbonyl N-oxide, pyrazinecarbonyl, imidazolecarbonyl, pyrazolecarbonyl or thiazolecarbonyl, said substituent being selected from a lower alkyl group, a C_{7-8} aralkyl group, a lower alkanoyl group, a benzoyl group or a halogen atom; or a C_{3-8} cycloalkanoyl group which may be substituted with a lower alkyl group, a lower alkenyl group, a halogen atom, a halogeno-lower alkenyl group, a phenyl group, a halogeno-phenyl group, a lower alkoxyphenyl group, a lower alkylphenyl group, a formyl group, a hydroxy group, an amino group, a carboxyl group, an aminomethyl group or an oxo group,

or a non-toxic salt thereof.

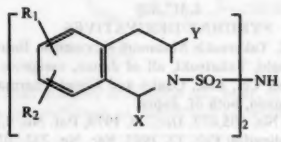
22. An antitumor composition which comprises an effective amount, for treating Lewis Lung Carcinoma in mice, of a compound of claim 1 as an active ingredient, and a pharmaceutically acceptable carrier or diluent.

4,317,826
N,N'-BIS[SUBSTITUTED-1,2,3,4 TETRAHYDROISOQUINOLYL]DISULFONYLIMIDES AND ANTIALLERGIC COMPOSITIONS AND METHOD OF USE

John G. Gleason, Delran, N.J., assignor to SmithKline Corporation, Philadelphia, Pa.

Filed May 27, 1980, Ser. No. 153,653
Int. Cl.[3] C07D *217/16;* A61K *31/47*
U.S. Cl. 424—258 20 Claims

1. A compound of the formula (I):



(I)

in which R_1 is hydrogen, bromo, chloro, methyl or trifluoromethyl; R_2 is bromo, chloro, trifluoromethyl or tetrafluoroethylthio; and X and Y independently are hydrogen or alkyl of 1 to 4 carbon atoms; or an alkali metal salt of said compound.

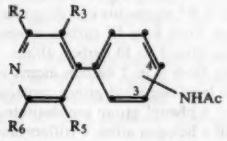
18. A method of inhibiting the symptoms of asthma which comprises administering to a subject in need of said inhibition a therapeutically effective amount for producing said inhibition of a compound of claim 1.

4,317,827
4-[4(OR 3)-ACYLAMINOPHENYL]PYRIDINES AND THEIR USE AS CARDIOTONICS

George Y. Lesher, Schodack, and Donald F. Page, East Greenbush, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

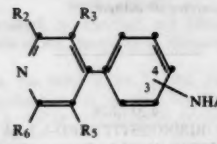
Filed May 27, 1980, Ser. No. 152,991
Int. Cl.[3] C07D *213/64;* A61K *31/44*
U.S. Cl. 424—263 15 Claims

1. A cardiotonic composition for increasing cardiac contractility, said composition comprising a pharmaceutically-acceptable inert carrier and, as the active component thereof, an effective amount of a cardiotonic 4-[4(or 3)-AcNH-phenyl]-2-R_2-3-R_3-5-R_5-6-R_6-pyridine having the formula



where R_2 is hydrogen, methyl, ethyl or hydroxyl, R_6 is hydrogen, methyl or ethyl, R_3 and R_5 are each hydrogen or methyl, and Ac is, hydroxyacetyl, acetoxyacetyl, α-hydroxypropionyl, α-acetoxypropionyl, methoxyacetyl or 2-butenoyl or when NHAc is attached to the 4-position of the phenyl ring Ac also is formyl, n-propanoyl or 3-carboxypropanoyl, or pharmaceutically-acceptable acid-addition salt thereof.

9. A 4-[4(or 3)-Ac'-NH-phenyl]-2-R_2-3-R_3-5-R_5-6-R_6-pyridine having the formula



where R_2 is hydrogen, methyl, ethyl or hydroxyl, R_6 is hydrogen, methyl or ethyl, R_3 and R_5 are each hydrogen or methyl, and Ac' is hydroxyacetyl, acetoxyacetyl, α-hydroxypropionyl, α-acetoxypropionyl, methoxyacetyl, 2-butenoyl or carbamyl or where NHAc' is attached to the 4-position of the phenyl ring Ac' also is formyl, n-propanoyl or 3-carboxypropanoyl, or pharmaceutically-acceptable acid-addition salt thereof.

4,317,828
PYRIDINE DERIVATIVES

Tadao Tanouchi, Takatsuki; Masanori Kawamura, Ibaraki, and Masaki Hayashi, Takatsuki, all of Japan, assignors to Ono Pharmaceutical Co., Ltd., Osaka and Kissei Pharmaceutical Co., Ltd., Nagano, both of, Japan

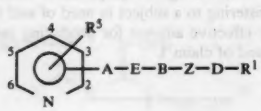
Division of Ser. No. 105,672, Dec. 20, 1979, Pat. No. 4,271,170. This application Feb. 12, 1981, Ser. No. 233,703

Claims priority, application Japan, Dec. 28, 1978, 53-161966; Aug. 7, 1979, 54-100377

Int. Cl.³ A61K *31/435;* C07D *213/55*

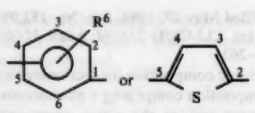
U.S. Cl. 424—263 **30 Claims**

1. A pyridine derivative of the formula (I):



(I)

wherein A represents an alkylene group containing from 1 to 5 carbon atoms unsubstituted or substituted by a hydroxy group, B represents an oxygen or sulphur atom, D represents an akylene group containing from 1 to 5 carbon atoms, E represents a grouping of the formula:



in which R^6 represents a hydrogen atom, or an alkyl group containing from 1 to 4 carbon atoms, Z represents a single bond, R^1 represents a grouping of the formula: —$COOR^4$ or —$COSR^4$ in which R^4 represents a hydrogen atom, or an alkyl group containing from 1 to 12 carbon atoms, or an aralkyl group containing from 7 to 13 carbon atoms, or a cycloalkyl group containing from 4 to 7 carbon atoms unsubstituted or substituted by at least one alkyl group containing from 1 to 4 carbon atoms, or a phenyl group unsubstituted or substituted by at least one of a halogen atom, a trifluoromethyl group, an alkyl or alkoxy or alkylthio group, each containing from 1 to 4 carbon atoms, a nitro group or a phenyl group, R^5 represents a hydrogen atom, or an alkyl group containing from 1 to 4 carbon atoms, and non-toxic acid addition salts thereof and, when R^1 represents a carboxy or thiocarboxy group, non-toxic salts thereof.

30. A pharmaceutical composition which comprises, as an active ingredient, an effective amount of at least one pyridine derivative as claimed in claim 1 and a non-toxic acid addition salt thereof and, when R^1 represents a carboxy or thiocarboxy group, a non-toxic salt thereof, in association with a pharmaceutical carrier or coating.

4,317,829
TRIAZOLE-SUBSTITUTED ETHYLENE DERIVATIVES

Graham J. Durant, Welwyn Garden City; John C. Emmett, Codicote; Charon R. Ganellin, Welwyn Garden City, and Hunter D. Prain, Welwyn, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

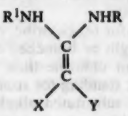
Division of Ser. No. 930,102, Aug. 1, 1978, Pat. No. 4,220,652, which is a division of Ser. No. 797,160, May 16, 1977, Pat. No. 4,124,717, which is a division of Ser. No. 629,174, Nov. 5, 1975, Pat. No. 4,046,907, which is a continuation-in-part of Ser. No. 468,617, May 9, 1974, Pat. No. 3,953,460. This application Feb. 4, 1980, Ser. No. 117,901

Claims priority, application United Kingdom, May 17, 1973, 23568/73

Int. Cl.³ A61K *31/41;* C07D *249/04, 249/08, 249/12*

U.S. Cl. 424—269 **6 Claims**

1. A compound of the formula:



wherein X and Y, which may be the same or different, are hydrogen, nitro, cyano or SO_2Ar but are not both hydrogen; R^1 is Het—$(CH_2)_mZ(CH_2)_n$; R is hydrogen, lower alkyl or Het—$(CH_2)_mZ(CH_2)_n$; Z is sulphur or methylene; m is 0, 1 or 2 and n is 2 or 3 provided that the sum of m and n is 3 or 4; Het is triazolyl which is attached at a ring carbon and is unsubstituted or substituted by lower alkyl, hydroxyl, halogen or amino; and Ar is phenyl unsubstituted or substituted by halogen or methyl or a pharmaceutically acceptable acid addition salt thereof.

5. A pharmaceutical composition to inhibit H-2 histamine receptors comprising a pharmaceutical carrier and in an effective amount to inhibit said receptors a compound of claim 1.

4,317,830
TREATMENT OF SHOCK

Peter B. Thorogood, London, England, assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

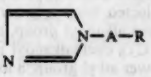
Continuation-in-part of Ser. No. 952,796, Oct. 19, 1978, abandoned, which is a continuation-in-part of Ser. No. 936,407, Aug. 24, 1978, abandoned. This application Aug. 17, 1979, Ser. No. 67,397

Claims priority, application United Kingdom, Aug. 26, 1977, 35912/77; Feb. 1, 1978, 3983/78; Aug. 8, 1978, 32536/78

Int. Cl.³ A61K *31/415*

U.S. Cl. 424—273 R **11 Claims**

1. A method of treating a mammal in a state of shock, which comprises administering to the mammal an effective amount of a compound of the formula



in which A is selected from the group consisting of straight or branched, saturated or unsaturated acyclic hydrocarbon radicals of from 1 to 3 carbon atoms and R is selected from the group consisting of cycloalkyl or cycloalkenyl groups of from 4 to 9 carbon atoms optionally substituted by one, two, three or more alkyl groups each containing from 1 to 4 carbon atoms, with the proviso that when A is a methylene radical, R is not

unsubstituted cyclohexyl, the alkylimidazole being the free base or a pharmaceutically acceptable salt thereof.

4,317,831

ANTIMICROBIAL DERIVATIVES OF 3-(1H-IMIDAZOL-1-yl)-2-PROPEN-1-ONES

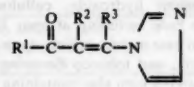
Hans Hoehn, Tegernheim, Fed. Rep. of Germany, assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation of Ser. No. 117,139, Jan. 30, 1980, Pat. No. 4,273,776. This application Jan. 12, 1981, Ser. No. 224,242

Int. Cl.³ A61K *31/415*

U.S. Cl. 424—273 R **4 Claims**

1. A method for treating infections in mammals caused by Trichomonas vaginalis which comprises administering to a mammalian host an effective amount of a compound of the formula



wherein

R^1 is lower alkyl; phenyl-lower alkyl; phenyl; substituted phenyl wherein the phenyl group bears one or two halogen, hydroxy, lower alkyl, lower alkoxy, lower alkylthio, cyano or nitro groups; 5- or 6-membered monocyclic aromatic heterocyclic containing one O, S or N atom; or substituted 5- or 6-membered monocyclic aromatic heterocyclic wherein the heterocyclic bears one halogen, hydroxy, lower alkyl, lower alkylthio, lower alkoxy, cyano or nitro group;

R^2 and R^3 are each hydrogen,

or a physiologically acceptable acid-addition salt thereof.

4,317,832

INDOLYL AND METHYLINDOLYL SUBSTITUTED AMINOALKYL GUANIDINES

Karl-Heinz Klingler, Lortzingstrasse 9, 607 Langen; Axel Kleemann, Greifenhagenstrasse 9, 6450 Hanau 9; Fritz Stroman, Herm. Steinh. Str. 18, 6050 Offenbach, and Klaus Thiemer, Fürstenbergstrasse 12, 6450 Hanau 9, all of Fed. Rep. of Germany

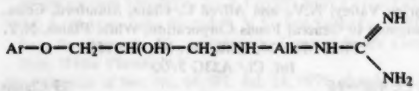
Filed Sep. 5, 1979, Ser. No. 72,777

Claims priority, application United Kingdom, Sep. 6, 1978, 35819/78

Int. Cl.³ A61K *31/40*; C07D *209/14*

U.S. Cl. 424—274 **14 Claims**

1. A substituted aminoalkyl guanidine corresponding to the following formula:



wherein Alk represents a C_2-C_5-alkylene group or such a group substituted by a hydroxy group and Ar represents indolyl and methyl indolyl or a pharmaceutically acceptable acid addition salt thereof.

8. A method of blocking the β-receptors of the adrenergic nerve system in a mammal comprising administering to the mammal an effective amount of a compound of claim **1** to block the β-receptors of the adrenergic nerve system.

4,317,833

METHOD FOR THE REDUCTION OF EXCESS GASTRIC ACID SECRETION

Thomas J. Sullivan, Thrussington, England, assignor to Fisons Limited, London, England

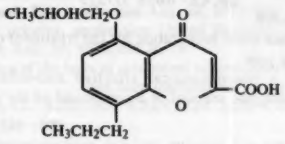
Filed Dec. 10, 1979, Ser. No. 101,464

Claims priority, application United Kingdom, Dec. 27, 1978, 49995/78

Int. Cl.³ A61K *33/08, 31/46, 31/35*

U.S. Cl. 424—283 **8 Claims**

1. A method for reducing the excessive secretion of gastric acid in a patient suffering from such condition, which method comprises administering to said patient a compound of the formula I,



I

or a pharmaceutically acceptable salt, ester, or amide thereof, in an amount sufficient to reduce said secretion.

4,317,834

COMBATING ARTHROPODS WITH FLUORINE-SUBSTITUTED SPIRO-CARBOXYLIC ACID BENZYL ESTERS

Rainer Fuchs, Wuppertal; Klaus Naumann, Leverkusen; Ingeborg Hammann, Cologne; Bernhard Homeyer, Leverkusen; Wolfgang Behrenz, Overath, and Wilhelm Stendel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

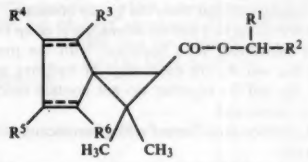
Filed Nov. 3, 1980, Ser. No. 203,032

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1979, 2947209

Int. Cl.³ A01N *53/00*; C07C *69/753, 121/75*

U.S. Cl. 424—304 **8 Claims**

1. A fluorine-substituted spirocarboxylic acid benzyl ester of the formula



in which

R^1 represents hydrogen, cyano or alkyl, alkenyl or alkynyl, with in each case up to 4 carbon atoms,

R^2 represents a phenyl radical which is substituted by halogen and/or by optionally halogen-substituted phenoxy, with the proviso that the radical R^2 contains in total at least one fluorine substituent, and

R^3, R^4, R^5 and R^6 each represent hydrogen, halogen or alkyl, or

R^3 and R^4, taken together, and/or R^5 and R^6, taken together, represent alkanediyl (alkylene) or a fused-on benzo radical,

and the C atoms of the 5-member spirocyclic ring are linked to one another either by double bonds or by single bonds.

6. A method of combating arthropods which comprises applying to the arthropods, or to a habitat thereof, an anthropodicidally effective amount of a compound according to claim **1**.

4,317,835

NOVEL BASIC SUBSTITUTED-ALKYLIDENAMINO-OXYALKYL-CARBOXYLIC ACID ESTERS

Jan van Dijk, and Johannes M. A. Zwagemakers, both of Weesp, Netherlands, assignors to Duphar International Research B.V., Netherlands

Division of Ser. No. 972,845, Dec. 26, 1978, Pat. No. 4,242,348, which is a continuation of Ser. No. 801,030, May 27, 1977, abandoned, which is a division of Ser. No. 509,807, Sep. 27, 1974, Pat. No. 4,044,023, which is a division of Ser. No. 151,793, Jun. 10, 1971, Pat. No. 3,853,955. This application Sep. 26, 1980, Ser. No. 191,100

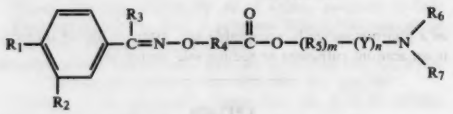
Claims priority, application Netherlands, Jun. 11, 1970, 7008493; Mar. 2, 1971, 7102715

Int. Cl.[3] A61K *31/215*

U.S. Cl. 424—309 4 Claims

1. A pharmaceutical preparation for the treatment of inflammation and/or pain

comprising a pharmaceutical effective anti-inflammatory and/or analgesic amount of a compound of the formula:



wherein R_1 is a moiety selected from the group consisting of hydrogen, halogen, CF_3 and CH_3,

R_2 is a moiety selected from the group consisting of chlorine and hydrogen,

R_3 is a moiety selected from the group consisting of hydrogen and CH_3,

R_4 is alkylene of up to 5 carbon atoms,

m and n are each 0 or 1 and m+n is 1 or 2,

R_5 is alkylene of up to 6 carbon atoms which may be substituted by phenyl,

Y is a cyclic hydrocarbon radical of 5 or 6 carbon atoms,

R_6 is a moiety selected from the group consisting of hydrogen, alkyl of up to 8 carbon atoms, cycloalkyl of 3 to 8 carbon atoms, phenyl, tolyl, and acetyl and (p.chloro α-methylbenzylidene) aminooxyacetyl, and

R_7 is a moiety selected from the group consisting of hydrogen, alkyl of up to 8 carbon atoms, alkyl of up to 8 carbon atoms substituted with hydroxyl with the proviso that when R_6 and R_7 are each alkyl or hydroxy substituted alkyl, R_6 and R_7 together do not contain more than 10 carbon atoms and

the acid addition salts thereof with pharmaceutically acceptable acids

and a liquid or finely divided solid carrier material therefor.

4,317,836

4-6-DIMETHYL-7-KETO-NONAN-3-OL AND SEX ATTRACTANT COMPRISING THE SAME

Tatsuji Chuman; Masahiro Kono, and Kunio Kato, all of Yokohama, Japan, assignors to The Japan Tobacco & Salt Public Corporation, Tokyo, Japan

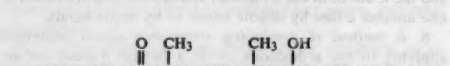
Filed Jan. 30, 1980, Ser. No. 117,025

Claims priority, application Japan, Mar. 28, 1979, 54-35518

Int. Cl.[3] C07C *49/17;* A01N *35/02*

U.S. Cl. 424—331 6 Claims

1. Pure 4,6-dimethyl-7-keto-nonan-3-ol having the structure:



2. A sex attractant comprising a carrier and pure 4,6-dimethyl-7-keto-nonan-3-ol as an active ingredient.

4,317,837

TOBACCO-FLAVORED CHEWING GUM

Gary Kehoe, Greenwich, Conn.; Wayne J. Puglia, Bellerose Village; Frank Witzel, Saratoga Springs, both of N.Y.; Dominick R. Friello, Danbury, Conn., and Donald A. M. Mackay, Pleasantville, N.Y., assignors to Life Savers, Inc., New York, N.Y.

Filed Nov. 25, 1980, Ser. No. 210,190

Int. Cl.[3] A23G *3/30*

U.S. Cl. 426—3 12 Claims

1. A tobacco-flavored chewing gum which simulates chewing tobacco, comprising gum base, from about 50 to about 95% by weight of a substantially calorie-free inert filler or texturizing agent dispersed in said gum base, said filler or texturizing agent being selected from the group consisting of calcium carbonate, aluminum hydroxide, alumina, magnesium carbonate, talc, aluminum silicates, dicalcium phosphate, magnesium trisilicate, magnesium hydroxide, cellulose and mixtures thereof, said gum base including at least 10% air voids entrapped in the gum base matrix, which, upon chewing, become filled with moisture, and tobacco flavoring mixed with said gum base, said chewing gum also containing from about 0.1 to about 5% by weight of a synthetic sweetener or from about 30 to about 80% by weight of a natural sweetener.

4,317,838

METHOD FOR APPLYING SUGARLESS COATING TO CHEWING GUM AND CONFECTIONS

Subraman R. Cherukuri, and Dominick R. Friello, both of Danbury, Conn., assignors to Life Savers, Inc., New York, N.Y.

Continuation of Ser. No. 77,968, Sep. 24, 1979, abandoned. This application Feb. 23, 1981, Ser. No. 237,336

Int. Cl.[3] A23G *3/30*

U.S. Cl. 426—5 13 Claims

1. A method for preparing a sugarless coated chewing gum or candy, which comprises the steps of applying to center portions of said chewing gum or candy a coating syrup comprising an aqueous solution of from about 30 to about 70% by weight of a normally sweet non-sugar hygroscopic material selected from the group consisting of sorbitol, mannitol, maltitol, isomaltitol, hydrogenated starch hydrolysate and mixtures thereof, from about 5 to about 30% by weight of a binder, from about 3 to about 15% by weight of an anti-sticking compound, and from about 2 to about 12% by weight of a dispersing agent and applying to said so-treated center portions a coating dusting mix comprising said normally sweet non-sugar hygroscopic material in dry form, at least a portion of said dry hygroscopic material being absorbed on the coating syrup applied to said center portions to form a coating on said center portions.

4,317,839

TAFFY-LIKE CONFECTION COMPOSITION

William A. Mitchell, Lincoln Park, N.J.; Gerald S. Wasserman, Spring Valley, N.Y., and Alfred C. Glatz, Stamford, Conn., assignors to General Foods Corporation, White Plains, N.Y.

Filed Mar. 24, 1980, Ser. No. 133,165

Int. Cl.[3] A23G *3/00*

U.S. Cl. 426—96 19 Claims

1. A confection composition comprising an admixture of:

(a) a sugar melt having a fructose content above 40% by weight dry basis; and

(b) from 0.1 to 5% of a surface active agent selected from the group consisting of stearoyl-2-lactylate, lecithin and mixtures thereof effective to lower the working temperature of the admixture to below 120° F., from 10–40% by weight of granules of gasified candy containing 0.5 to 15 cm^3 of gas/gram of gasified candy having a particle size of −4 to +40

U.S. Standard Sieve size, said admixture having a moisture content of below 5%.

4,317,840

ENROBINC COMPOSITION FOR FROZEN COMESTIBLES

Daniel R. Sortwell, III, Mamaroneck, N.Y., assignor to SCM Corporation, New York, N.Y.

Filed Oct. 17, 1980, Ser. No. 197,957

Int. Cl.³ A23D *5/00*

U.S. Cl. 426—100 **11 Claims**

1. A sauce coating base for liquid phase application to a frozen comestible, a coating formed therefrom being characterized by resistance to cracking at frozen food temperatures, comprising

(a) from 35 to 45 parts by weight of a nonrandom triglyceride hard butter consisting essentially of acids of 16 and 18 carbons distributed in the following ranges:

	Percent by Weight
Saturated fatty acids	25–55
Trans monoethanoic acids	30–50
Cis monoethanoic acids	15–40

and

(b) from 55–65 parts by weight of a partially hydrogenated edible vegetable oil said edible oil having an Iodine Value of about 97–102, components (a) and (b) totalling 100 parts by weight.

4,317,841

PROCESS FOR THE DEACIDIFICATION OF A COFFEE EXTRACT

Edgardo Brambilla, Vevey, and Ian Horman, Corseaux, both of Switzerland, assignors to Societe D'Assistance Technique Pour Produits Nestle S.A., Lausanne, Switzerland

Filed Mar. 10, 1980, Ser. No. 128,725

Claims priority, application Switzerland, Apr. 18, 1979, 3632/79

Int. Cl.³ A23F *5/18*

U.S. Cl. 426—239 **10 Claims**

1. A process for the preparation of a coffee extract of reduced acidity, which comprises subjecting an aqueous coffee extract, selected from the group consisting of an extract of green coffee, an extract of roasted coffee, a decaffeinated extract of green or roasted coffed and an extract of decaffeinated green coffee, to electrodialysis, recovering a cathodic and non-cathodic extract, contacting the non-cathodic extract with chitosan in divided form, removing the chitosan, and combining the non-cathodic extract with at least a part of the cathodic extract, wherein the acidity of the coffee extract is reduced such that the pH is increased in excess of from 1.5 to 5 pH units.

4,317,842

PREPARING FROZEN PAR-FRIED POTATO STRIPS

Nabil A. El-Hag, Lake Peekskill, N.Y., and Sudhakar P. Shanbhag, Bourbonnais, Ill., assignors to General Foods Corporation, White Plains, N.Y.

Continuation of Ser. No. 64,307, Jul. 24, 1979, abandoned. This application Dec. 2, 1980, Ser. No. 212,177

Int. Cl.³ A23B *7/04*; A23L *1/216*

U.S. Cl. 426—302 **8 Claims**

1. A method for improving the taste, texture, moisture and appearance of frozen potato slices wherein the potato slices consist of whole potato strips that are to be heated in an oven before consumption which comprises:

(a) coating potato slices with a layer of starch,

(b) soaking the potato slices in an oil bath having a temperature from 120° F. to 210° F. for two to six minutes to substantially gelatinize the coated potato surface,

(c) par-frying said potato slices by immersing the starch coated, oil soaked potato slices in oil until an acellular surface is obtained,

(d) freezing the par-fried potato slices for commercial distribution.

4,317,843

MICROBIOLOGICAL PRODUCTION OF PROTEIN

David G. MacLennan; John C. Ousby; Terence R. Owen, and David C. Steer, all of Stockton-on-Tees, England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 416,098, Nov. 15, 1973, Pat. No. 3,989,594, which is a continuation of Ser. No. 203,061, Nov. 29, 1971, abandoned. This application Aug. 30, 1976, Ser. No. 718,623

Claims priority, application United Kingdom, Dec. 9, 1970, 58466/70; Aug. 19, 1971, 38938/71

The portion of the term of this patent subsequent to Nov. 2, 1993, has been disclaimed.

Int. Cl.³ A23J *1/00*; C12N *1/32, 1/20*; C12R *1/01*

U.S. Cl. 426—656 **4 Claims**

1. A proteinaceous product suitable for use as a protein supplement or source comprising dried cells of bacteria belonging to at least one methanol-utilizing strain of a species selected from the group consisting of *Pseudomonas methylotropha* and *Pseudomonas rosea* said cells having a protein content between 53% and 88% by weight (N×6.25).

2. A food composition comprising a foodstuff and a proteinaceous food supplement comprising dried cells of bacteria belonging to at least one methanol-utilizing strain of a species selected from the group consisting of *Pseudomonas methylotropha* and *Pseudomonas rosea* said cells having a protein content between 53% and 88% by weight (N×6.25).

4,317,844

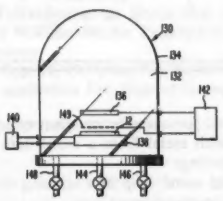
SEMICONDUCTOR DEVICE HAVING A BODY OF AMORPHOUS SILICON AND METHOD OF MAKING THE SAME

David E. Carlson, Yardley, Pa., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 840,038, Oct. 6, 1977, abandoned, which is a division of Ser. No. 710,183, Jul. 30, 1976, Pat. No. 4,064,521, which is a continuation-in-part of Ser. No. 659,268, Feb. 19, 1976, abandoned, which is a continuation-in-part of Ser. No. 599,588, Jul. 28, 1975, abandoned. This application Feb. 25, 1980, Ser. No. 124,645

Int. Cl.³ C23C *11/00*

U.S. Cl. 427—39 **11 Claims**



1. A method of fabricating an amorphous silicon semiconductor device incorporating a rectifying junction, said method comprising:

placing an electrically conductive substrate in a glow discharge apparatus;

reducing the pressure in said apparatus to a pressure of from about 10^{-3} to about 10^{-6} Torr;

heating said substrate to a temperature of from about 150° to about 450° C.;

initiating a glow discharge in an atmosphere including silane at a pressure of about 0.1 to about 0.5 Torr so as to form a body

of amorphous silicon on said electrically conductive substrate;

continuing said glow discharge while altering the relative proportion of silane and conductivity modifiers such that said body has layers of differing conductivity, said layers forming rectifying junction; and

fabricating an electrical contact to said body of amorphous silicon opposite to the surface contacting said electrically conductive substrate.

10. A glow discharge apparatus capable of depositing a body of amorphous silicon on the surface of a substrate, wherein said body of amorphous silicon can form a rectifying junction within said body or at the surface of said body, said apparatus comprising;

a vacuum chamber;

an electrode in said vacuum chamber electrically connected to a terminal of a DC power source;

a heating element in said vacuum chamber capable of upholding said substrate;

a screen electrode in said vacuum chamber electrically connected to an opposite terminal of said DC power source and spaced between said electrode and said heating element with the spacing between screen electrode and said substrate at a pressure of from about 0.1 to about 5.0 Torr being on the order of the cathode dark space region of the glow discharge; and

a source adapted to incorporate N-type or P-type dopants into said vacuum chamber during the fabrication said body of amorphous silicon.

4,317,845

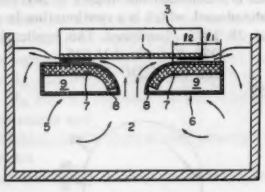
ONE SIDE SURFACE MOLTEN METALLIC COATING METHOD AND APPARATUS THEREOF

Kunihiko Karasawa, Yokohama; Tokushiro Hosoda, Tokyo; Hiroshi Mase; Yasuo Sato, both of Yokohama, and Shoji Shimada, Kamakura, all of Japan, assignors to Asahi Glass Co. Ltd. and Nihon Parkerizing Co., both of Tokyo, Japan

Filed Apr. 1, 1980, Ser. No. 136,339

Int. Cl.³ C23C *1/02*

U.S. Cl. 427—47 **11 Claims**



1. A method for one side metallic coating of a continuous metal strip with metal from a metal bath having a normal surface comprising:

moving said metal strip in a running direction through a metallic coating contact area;

maintaining said metal strip, in said contact area, substantially linear in a direction transverse to said running direction; and

utilizing linear induction motor means in said bath to move the molten metal adjacent said normal surface in a second direction at least adjacent the transverse edges of said metal strip, said second direction having a component transverse to said running direction, and said second direction being entirely in the plane of said surface, whereby one entire surface of said metal strip is contacted with said molten metal.

4,317,846

DISPERSIONS FOR ACTIVATING NON-CONDUCTORS FOR ELECTROLESS PLATING

Nathan Feldstein, 63 Hemlock Circle, Princeton, N.J. 08540

Division of Ser. No. 934,344, Aug. 17, 1978, Pat. No. 4,220,678, and Ser. No. 830,456, Sep. 6, 1977, abandoned, which is a continuation-in-part of Ser. No. 731,212, Oct. 12, 1976, Pat. No. 4,136,216, which is a division of Ser. No. 607,506, Aug. 26, 1975, Pat. No. 3,993,799, which is a continuation-in-part of Ser. No. 512,224, Oct. 4, 1974, abandoned. This application Aug. 29, 1980, Ser. No. 182,811

Int. Cl.³ C23C *3/02*

U.S. Cl. 427—98 **10 Claims**

1. A process for rendering a non-conductor substrate receptive to electroless metal depoeition which comprises contacting said substrate with a catalytic colloidal dispersion of a non-precious metal selected from the group consisting of copper, cobalt, nickel and iron and mixtures thereof and wherein said catalytic colloidal dispersion is derived by lowering the pH of a colloidal dispersion having a pH value greater than said catalytic colloidal dispersion and further wherein the pH of said colloidal dispersion is at least 9.5.

4,317,847

PROCESS FOR PRODUCING A SIMULATED WEATHERED ANTIQUE WOOD APPEARING FINISH

Nello Batistelli, 11445 Santa Gertrudes, Apt. #27, Whittier, Calif. 90604

Filed Apr. 28, 1977, Ser. No. 791,789

Int. Cl.³ B05D *5/06*

U.S. Cl. 427—260 **4 Claims**

1. The method of producing a simulated weathered antique wood finish on a surface which comprises the steps of applying an opaque colored base coat of paint substantially over all said surface,

thereafter brushing a second coat of a generally opaque paint of a different color than that of said first base coat over said base coat while said base coat is still wet using generally parallel strokes parallel to said surface,

said second coat of paint being compatible with said base coat and being blendable in color under brushing pressure with said wet base coat,

exerting a heavier brushing pressure against said surface at the commencement of each brush stroke and gradually reducing said brushing pressure during the remainder of said brush stroke whereby to form a streaked pattern wherein said second coat blends in color with said base coat a greater amount during heavy brushing pressures and blends with said base coat a lesser amount during light brushing pressures,

thereafter brushing a generally opaque third coat of paint of a different color than that of said second coat over said second coat while said second coat is still wet,

using generally parallel strokes parallel to said surface which are substantially parallel to said first mentioned strokes but spaced different distances apart,

said third coat of paint being compatible with said second coat and being blendable in color under brushing pressure with said wet second coat, and

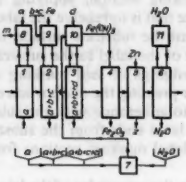
exerting a heavier brushing pressure against said surface at the commencement of each brush stroke of said third coat and gradually reducing said brushing pressure during the remainder of said brushing stroke whereby said third coat blends in color with said second coat a greater amount during heavy brushing pressures and blends with said second coat a lesser amount during light brushing pressures.

4,317,848

METHOD OF SEWAGELESS METALLIZATION, ESPECIALLY GALVANIZING OF A STEEL SURFACE

Ryszard Mellerowicz, Poznan, Poland, assignor to Kombinat Produkcji i Montazu Obiektow Budownictwa Ogolnego z Lekkich Konstrukcji Stalowych "Metalplast", Obnorniki, Poland

Filed Apr. 17, 1980, Ser. No. 141,196
Claims priority, application Poland, Apr. 26, 1979, 215171
Int. Cl.³ C23C 1/02
U.S. Cl. 427—309 1 Claim



1. A method for coating a metal substrate with another metal, including particularly the zinc-coating of steel surfaces, to substantially eliminate the production of sewage and/or harmful waste products, comprising contacting the substrate successively with a series of baths to perform the steps of degreasing, etching, activation, and metal coating, the components of each bath containing not only those components necessary to perform the function of that bath but also components from the preceding bath, recycling the waste products from each bath to a preceding bath containing the same components as said waste products, regenerating the baths as depleted, and washing the resulting product with water only after coating thereof has been completed.

4,317,849

PROCESS FOR PRODUCING HIGH-GLOSS COATED PAPER

Toshimasa Ogura, Tokyo, and Masafumi Masuda, Kashiwa, both of Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Oct. 31, 1980, Ser. No. 203,223
Claims priority, application Japan, Nov. 6, 1979, 54-143657; Dec. 29, 1979, 54-172984; Jan. 24, 1980, 55-7158
Int. Cl.³ B05D 3/02, 3/12
U.S. Cl. 427—362 6 Claims

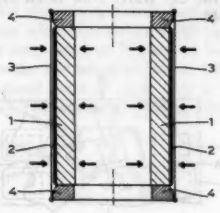
1. A process for producing a high-gloss coated paper by coating a paper or a prime-coated paper with an aqueous coating solution comprising a synthetic polymer latex (A) having a glass transition temperature of at least 38° C., a synthetic polymer latex (B) having a glass transition temperature of 5° to 25° C., and a pigment for coated papers, drying the coated paper, and then bringing the coated surface into contact with a hot calender under pressure at a temperature not lower than the glass transition temperature of the synthetic polymer latex (A), thereby mirror-finishing the coated paper, characterized in that the weight ratio (as solids) of the synthetic polymer latex (A) to the synthetic polymer latex (B) is 1:0.2–1:0.67.

4,317,850

METHOD FOR APPLYING A DENSE, HARD, ADHESIVE AND WEAR-RESISTANT LAYER OF CERMETS OR CERAMIC MATERIAL ON A METAL OBJECT

Martin B. Verburgh, Amersfoort, and Hans B. van Nederveen, Bilthoven, both of Netherlands, assignors to SKF Industrial Trading and Development Company B.V., Nieuwegein, Netherlands

Filed Jul. 9, 1980, Ser. No. 167,038
Claims priority, application Netherlands, Aug. 3, 1979, 7905973
Int. Cl.³ B05D 3/12, 1/10
U.S. Cl. 427—370 15 Claims



1. In a method for applying a dense, hard, adhesive and wear-resistant layer of cermets or ceramic material on a metal object by spray coating said object with a mixture of hard cermet or ceramic particles with a bonding metal, and compressing said coating on said object, the improvement which comprises:

(a) applying a gas-tight metal foil over the sprayed-on coating;

(b) isostatically compressing the metal foil and the sprayed-on coating onto said metal object under a pressure in the range from about 500 to 2000 bar, at a temperature within the range from about 500° to about 2000° C. for a period from about one-half hour up to about eight hours, said temperature being below the melting point of said bonding metal but high enough to sinter said coating; and

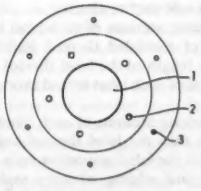
(c) removing said metal foil; whereby a dense, hard wear-resistant layer of cermets or ceramic material and bonding metal is strongly diffusion bonded on said metal object.

4,317,851

METHOD FOR SPRAY APPLYING AN INSULATING COATING TO METALLIC OR NON-METALLIC OBJECTS

Rudolf P. Neser, Ludwigshafen am Rhein, Fed. Rep. of Germany, assignor to Woellner-Werke, Ludwigshafen am Rhein, Fed. Rep. of Germany

Filed Sep. 21, 1979, Ser. No. 77,767
Claims priority, application Fed. Rep. of Germany, Sep. 25, 1978, 2841624
Int. Cl.³ B05D 1/12, 1/34, 1/02
U.S. Cl. 427—426 12 Claims



1. A method for spray application of a protective coating to an object comprising spraying the coating onto the object, said coating being a mixture of mineral fibers and a binding material

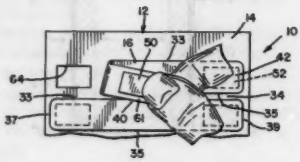
consisting of a solution of at least one alkali silicate, at least and at least one water-soluble and alkali-resistant organic polymer, wherein a hardener for hardening said alkali silicate binding material is added to said coating by independently conveying said hardener in the form of a solution to a spray nozzle which independently projects said mixture and said hardener towards the substrate being treated.

4,317,852

LABEL ASSEMBLY WITH LABEL END FINGER HOLD ARRANGEMENT

Ralph Ogden, 1304 Fisher St., Munster, Ind. 46321

Filed Jul. 21, 1980, Ser. No. 170,825
Int. Cl.³ D21H *1/04;* B32B *33/00*
U.S. Cl. 428—40 **2 Claims**



1. In a label assembly including a carrier sheet having a release agent coating on one side of same and a plurality of pressure sensitive adhesive backed labels removably adhered to said carrier sheet coating, the improvement wherein:

said labels are of substantially rectangular configuration disposed in parallel, uniformly spaced apart, superposed, columnar relation on said coating, with said labels each having a blank facing on the front side of same for receiving typewriter applied identification indicia, which facing is bounded by a perimeter forming circumambient marginal edging,

said facings of said labels being of substantially equal areas and substantially similar configuration,

said carrier sheet being of quadrilateral perimeter configuration and said labels being of substantially the same length dimension and being disposed on said carrier sheet such that said length dimensions thereof extend transversely of said carrier sheet,

with each of said labels having a first terminal end portion at one end of same and a second terminal end portion at the other end of same,

said one ends of said labels being columnarly aligned across said one side of said carrier sheet and said other ends of said labels being columnarly aligned across said one side of said carrier sheet,

said carrier sheet being severed at the portions thereof underlying the respective ends of each of said labels to define from said carrier sheet a quadrilateral masking section paralleling said labels having a marginal edging defining the perimeter of same,

with the masking section at each label end being fully severed from said carrier sheet,

and the masking sections of each label being adhered to the adhesive of the label thereof, and being spaced apart across the length of the label thereof whereby said masking sections of each label extend short of the midportion of the label,

with the masking sections of each label being of less width dimension than the label thereof and being substantially centered on the label respective ends and lying within the label marginal edging whereby said labels at each end thereof have their backings adhered to said carrier sheet release agent coating about the marginal edgings of the masking sections thereof,

said assembly being adapted for application to a typewriter as a whole for application of typewriter applied identification indicia to said label facings,

said labels each being manually removable from said carrier sheet and adhered to a substrate surface that is to receive the label by:

separating one of the label ends from the carrier sheet and drawing it outwardly of the carrier sheet to bring with it the label masking sections from the carrier sheet and fully separate the label and its said masking sections from the carrier sheet,

with the user then finger holding each label end and its underlying masking section, applying the label to the substrate surface that is to receive the label by pressing the label ends against the substrate surface, to obtain preliminary adherance of the label to the substrate surface about said marginal edgings of said masking sections of such label, and finger pressing the midportion of the label adhesive backing into adherance with the substrate surface,

then freeing said label ends from the substrate surface and separating the label masking sections from either end of same,

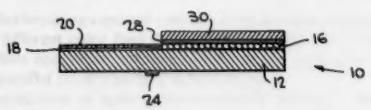
and finger pressing the remainder of the label into full adherance with the substrate surface.

4,317,853

ROOFING SHINGLE

Eyvind M. Thiis-Evensen, Eidanger, Norway, assignor to Isola Fabrikker A/S, Eidanger, Norway

Continuation of Ser. No. 27,039, Apr. 4, 1979, abandoned, which is a continuation-in-part of Ser. No. 952,731, Jun. 1, 1978, Pat. No. 4,195,461, which is a continuation-in-part of Ser. No. 893,974, Apr. 6, 1978, Pat. No. 4,188,763. This application May 5, 1980, Ser. No. 146,271
Claims priority, application Norway, Apr. 14, 1977, 771308
The portion of the term of this patent subsequent to Feb. 19, 1997, has been disclaimed.
Int. Cl.³ B32B *5/16, 11/10*
U.S. Cl. 428—80 **18 Claims**



1. A roofing shingle which comprises

a generally flat web having a top surface and a bottom surface, said web including a generally rectangular main portion and at least one tongue portion extending away therefrom,

a monolayer of rubber particles covering the tongue portion and a part of the main portion of said web on the bottom surface thereof, said rubber particles having the diameter of at least 1 mm,

a layer of adhesive coated on the bottom surface of said web not covered by said monolayer of rubber particles,

a layer of stiffening material attached to at least a part of the monolayer of rubber particles on the side thereof opposite the web, and

an adhesive coating on at least a part of the top surface of said web.

4,317,854

VACUUM-INSULATED PANEL

Richard K. Rathmell, 12 Pine Tree Rd., Ramsey, N.J. 07446

Filed Jun. 11, 1979, Ser. No. 47,167
Int. Cl.³ B32B *3/28*
U.S. Cl. 428—182 **4 Claims**

1. An improved vacuum-insulated panel of the type having an evacuated space between two impervious sides and sealed edges, and compressively-loaded spacers to hold the sides

apart, wherein the compressively-loaded spacers do not reach from one side of the panel to the other side, but reach instead

to a web which is stressed in tension and positioned between the two sides.

4,317,855

ELECTRICALLY CONDUCTIVE WHITE COATINGS

Jean-Claude Guillaumon, Ayguesvives, and Louis J. C. Blet, Ramonville St. Agne, both of France, assignors to Centre National d'Etudes Spatiales, Paris, France

Filed May 20, 1980, Ser. No. 151,564

Claims priority, application France, May 30, 1979, 79 13812

Int. Cl.³ B32B *7/02, 15/02, 15/04*

U.S. Cl. 428—212 **15 Claims**

1. An electrically conductive white coating of the paint type disposed on a substrate, said white coating comprising:

(a) a first layer having a surface resistance lower than 1 ohm/-square,

(b) a white layer disposed contiguously to the first layer and having a surface resistance higher than 10^5 ohms/square,

(c) said coating having a solar absorption α_s not greater than 0.30, a hemispherical emission factor ϵ not less than 0.80, and a surface resistance R_s measured in a vacuum lower than 10^{-5} torr, not greater than 10^9 ohms/square.

2. A white coating as defined in claim 1 wherein the first layer includes a metallic particulate material.

4,317,856

INSULATING-MATERIAL BODIES HAVING METAL PARTICLES DISPERSED IN THE RESIN

Dirk Huthweiker, Troisdorf; Arnold Franz, Troisdorf-Spich, and Siegfried Köpnick, Troisdorf, all of Fed. Rep. of Germany, assignors to Dynamit Nobel AG, Troisdorf, Fed. Rep. of Germany

Filed Nov. 30, 1979, Ser. No. 99,224

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1978, 2852375

Int. Cl.³ B32B *15/00*

U.S. Cl. 428—273 **5 Claims**

1. In a process for the formation of a resin containing insulating body containing reduced metal particles which body can be electrolessly coated with a metal, the insulating body being produced by impregnating webs of cellulosic material or glass fiber webs with one or more resin solutions, drying the impregnated web, and curing one or a plurality of sections of the dried web under heat and pressure, the improvement wherein to at least one of said resin impregnating solutions there is added an aqueous ammonium chloride containing solution of 0.01 to 3 weight percent, based on the weight of solids in said resin impregnating solution of a reducible metal compound of Group VIII or Ib of the Periodic Table of the Elements, said ammonium chloride being present in said solution in an amount of 1.5 to 2.5 times the weight of said reducible metal and reducing said metal compound to metal particles finely divided within the cured resin portion of the insulating body by drying and heating.

4,317,857

COMPOSITE COATED METAL SHEET

Katsumi Kanda; Yoshikazu Kondo, both of Kudamatsu, and Yoshiyuki Sugimoto, Hikari, all of Japan, assignors to Toyo Kohan Co., Ltd., Japan

Filed Dec. 17, 1979, Ser. No. 104,458

Int. Cl.³ B32B *5/16, 15/08, 27/30*

U.S. Cl. 428—334 **7 Claims**

1. A coated sheet comprising a steel sheet substrate coated with a composition which comprises a 100 parts by weight polyvinylchloride resin and 5 to 70 parts by weight of flake-like aluminum powder and baked at 150° to 250° C.

3. The coated metal sheet of claim 1 or 2, which further comprises a top layer of an acrylic-type resin film of 20 to 200 μm thickness.

4,317,858

ULTRAVIOLET CURABLE SOLVENT-FREE WIRE ENAMEL BLENDS

Frank A. Sattler, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 27, 1980, Ser. No. 163,899

Int. Cl.³ B32B *15/08;* **C08F** *283/04;* **C08L** *61/34, 79/08*

U.S. Cl. 428—379 **23 Claims**

1. A wire enamel blend, curable to the B-stage with UV light followed by heat, comprising:

(1) up to about 40% of an acrylated epoxy dissolved in unsaturated monomer;

(2) about 2 to about 26% of an acrylated polybutadiene;

(3) about 3 to about 26% of an acrylated polyester-amide-imide dissolved in unsaturated monomer and in an unsaturated diester;

(4) about 30 to about 65% of an end-blocked urethane dissolved in unsaturated monomers and hydroxy-terminated unsaturated diesters;

(5) up to about 15% of a cresol formaldehyde resin dissolved in unsaturated monomers;

(6) about 1.5 to about 5% of a UV photoinitiator;

(7) up to about 5% of an acrylated hexamethoxymethyl melamine; and

(8) up to about 0.1% of a flow control agent.

4,317,859

SOIL-RESISTANT YARNS

Andrew I. Smith, Pensacola, Fla., assignor to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 24,349, Mar. 27, 1979, abandoned. This application Jul. 14, 1980, Ser. No. 167,981

Int. Cl.³ B32B *9/00, 15/00;* **D02G** *3/00*

U.S. Cl. 428—389 **5 Claims**

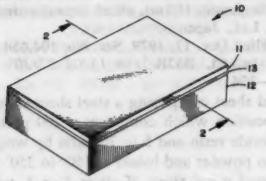
1. A yarn having a coating thereon comprising (i) an effective amount of a soil retardant selected from fluorochemicals containing a perfluoroalkyl radical and (ii) a metal oxide selected from the group consisting of zirconium oxide, tin oxide and titanium oxide, said coating being characterized in that said metal oxide being present in an amount sufficient to enhance the retention of the fluorochemical soil retardant on said yarn.

4,317,860

POLYVINYLIDENE FLUORIDE-THERMOPLASTIC RESIN LAMINATES AND METHOD

Albert Strassel, Oullins, France, assignor to Produits Chimiques Ugine Kuhlmann, Courbevoie, France

Filed Aug. 31, 1979, Ser. No. 71,675
Claims priority, application France, Sep. 25, 1978, 78 27361; May 22, 1979, 79 12952
Int. Cl.³ B32B 27/00
U.S. Cl. 428—421 7 Claims



1. A unitary laminate comprising at least one polyvinylidene fluoride resin layer, a layer of a thermoplastic resin other than a polyvinylidene fluoride, and a layer of a polyalkyl methacrylate intermediate and firmly adhered to said polyvinylidene fluoride and thermoplastic resin layers; said layers being blended at their interfaces only.

4,317,861

SYNTHETIC RESIN FOR USE AS ADHESIVE IN PREPARING COMPOSITE MATERIAL COMPRISING POLYVINYLIDENE FLUORIDE AND POLYVINYL CHLORIDE, SAID COMPOSITE AND METHODS FOR PREPARING SAID RESIN AND SAID COMPOSITE MATERIAL

Kunizoh Kidoh; Fujio Suzuki, and Kazuo Kushida, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 104,397, Dec. 17, 1979, abandoned. This application Aug. 26, 1980, Ser. No. 181,474
Claims priority, application Japan, Dec. 27, 1978, 53-161895
Int. Cl.³ B32B 27/08
U.S. Cl. 428—421 1 Claim

1. A corrosion resistant composite material of a laminate comprising at least a combination of a layer of vinylidene fluoride resin, a layer of a graft copolymer and a layer of vinyl chloride resin,

said composite material being obtained by coextruding said polyvinylidene fluoride, said polyvinyl chloride and said graft copolymer of melt index of 1×10^2 to 1×10^6 ps as determined in a Koka-type flow tester at 220° C. under a load of 100 kg/cm^2 containing 30 to 500 parts by weight of side chains consisting of homo- or copolymer of vinylidene fluoride to 100 parts by weight of homo- or copolymer of methyl methacrylate as a main backbone chain, said graft copolymer being inserted between said polyvinylidene fluoride and said polyvinyl chloride within the die for the coextrusion to be used as said adhesive layer.

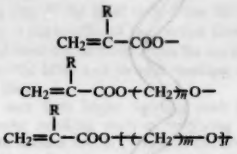
4,317,862

SANDWICH GLASS

Toshio Honda, Akigawa; Itsuo Tanuma, Tokorozawa; Masao Ogawa, Kawagoe; Hikaru Ishikawa, Kokubunji; Yukio Fukuura, Kodaira; Setsuo Akiyama; Shozo Ojima, both of Higashimurayama, and Kazuo Naito, Kodaira, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Dec. 28, 1979, Ser. No. 108,093
Claims priority, application Japan, Dec. 28, 1978, 53-161003
Int. Cl.³ B32B 17/10, 27/30
U.S. Cl. 428—442 5 Claims

1. A sandwich glass comprising glass plates and an intermediate layer interposed therebetween, said intermediate layer being formed by photosetting a photosensitive resin consisting essentially of a high polymer having acryloyloxy group- or methacryloyloxy group-containing groups represented by the following formulae (I)–(III),



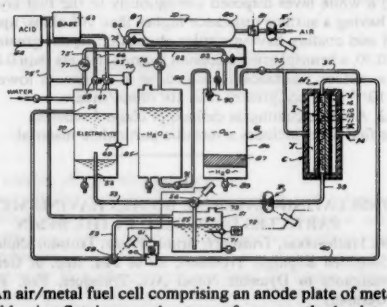
wherein R represents a hydrogen atom or methyl group, n represents a positive integer of 2–5, m represents a positive integer of 1–4 and l represents a positive integer of 1–30, which is obtained by adding acrylic acid, methacrylic acid, or ester thereof, having a terminal active hydrogen atom, to a high polymer having olefinically unsaturated double bonds in in the presence of an alkyl hypohalite or a N-haloamide compound, and at least one acryloyloxy group- or methacryloyloxy group-containing compound selected from acrylic acid, methacrylic acid and their derivatives, and wherein the mixing ratio of the high polymer to the acryloyloxy group- or methacryloyloxy group-containing compound is within the range of 90/10-5/95 in weight ratio and the amount of the acrylolyoxy or methacryloyloxy groups in the high polymer is at least one group per 50,000 of the high polymer molecular weight.

4,317,863

FUEL CELL

Ralph C. Struthers, Saugus, Calif., assignor to Universal Fuel Systems, Inc., Saugus, Calif.

Filed Jun. 3, 1980, Ser. No. 155,962
Int. Cl.³ H01M 12/06
U.S. Cl. 429—19 6 Claims



1. An air/metal fuel cell comprising an anode plate of metallic fuel having flat, inner and outer surfaces, a cathode plate of micro-porous electro catalytic materials, an elongate case with outer ends and defining an interior space, said anode plate is arranged transverse said interior space between the ends thereof and is shiftable axially therein, said cathode plate is mounted in the case to extend transverse said interior space in fixed position between the ends of the case with its outer surface spaced from one end of the case and defining a first air chamber and with its inner surface opposing the inner surface of the anode plate and defining an electrolyte chamber, a positive electric terminal extending through the case with an outer end and projecting from the case and an inner end connected with the cathode plate, an electric collector in the electrolyte chamber and a dielectric insulator through which electrolyte is free to flow positioned between the collector and the cathode maintaining the inner opposing surfaces of the plates in predetermined spaced relationship, a negative electric terminal extending through the case with an outer end project-

ing from the case and an inner end connected with the collector, a flexible diaphragm mounted in the case and extending transverse the interior space in spaced relationship from the other end of the case and defining a second air chamber and engaging the outer surface of the anode plate, electrolyte supply means connected with the case and conducting liquid eletrolyte into the electrolyte chamber at predetermined pressure, air supply means connected with the case and conducting air at greater pressure than the pressure on the electrolyte into said first air chamber to supply oxygen to the cathode plate and into said second chamber to urge the diaphragm and anode plate axially toward the collector and the cathode plate.

4,317,864

BATTERY CONSISTING OF A MULTIPLICITY OF ELECTROCHEMICAL CELLS

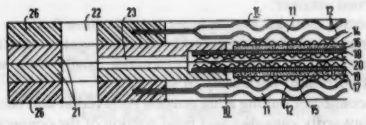
Karl Strasser, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jun. 26, 1978, Ser. No. 918,954

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1977, 2729640

Int. Cl.³ H01M *2/10, 8/02*

U.S. Cl. 429—36 **10 Claims**



1. In a battery, consisting of a multiplicity of electrochemical cells, in particular fuel cells for the conversion of at least one gaseous reactant, with a support frame for the accommodation of a liquid electrolyte for each cell; with a diaphragm, gastight in a liquid impregnated state, on at least one side of the support frame; with an electrode of catalytic material in powder form, strengthened by binders if applicable, on the diaphragm side facing away from the support frame; and with a spacer screen for the support of the catalytic material, as well as with pressure pads for the compression of the entire arrangement, the improvement comprising, metallic contact pieces for current collection disposed between the spacer screens of each two adjacent cells and at the battery ends forming said pressure pads, with each contact piece containing a cavity to which a pressurized medium can be supplied, in the sense of the exertion of a uniform bearing pressure on the catalytic material of the adjacent cells.

4,317,865

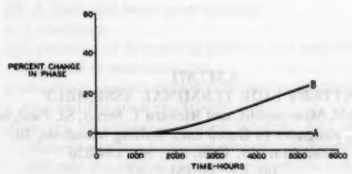
CERIA MATRIX MATERIAL FOR MOLTEN CARBONATE FUEL CELL

John C. Trocciola, Glastonbury; Craig R. Schroll, West Hartford, and Raymond W. Vine, Avon, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 24, 1980, Ser. No. 189,886

Int. Cl.³ H01M *8/14*

U.S. Cl. 429—41 **8 Claims**



1. A molten carbonate fuel cell electrolyte-matrix material consisting essentially of alkali metal carbonate electrolyte in intimate combination with ceria matrix material which undergoes substantially no crystalline phase change or reaction with electrolyte for at least 2000 hours under molten carbonate fuel cell operating conditions.

4,317,866

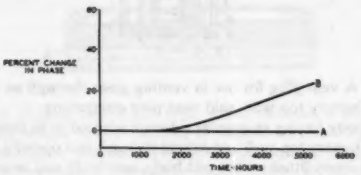
MOLTEN CARBONATE FUEL CELL ANODE

John C. Trocciola, and Richard C. Nickols, Jr., both of Glastonbury, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 24, 1980, Ser. No. 189,887

Int. Cl.³ H01M *8/14*

U.S. Cl. 429—41 **4 Claims**



1. A fuel cell including an electrolyte-matrix containing an alkali metal carbonate electrolyte which is molten during operation of the fuel cell, an anode electrode in contact with the electrolyte-matrix and a cathode electrode spaced apart from the anode electrode and in contact with the electrolyte-matrix, wherein the improvement comprises a molten carbonate electrolyte compatible, oxidation resistant, structurally stable, catalytically active, electron conductive ceria anode.

4,317,867

ELECTRODE FOR AN ELECTRIC CELL

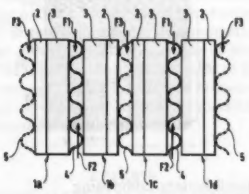
Bernard Warszawski, Paris, France, assignor to Societe Generale de Constructions Electriques et Mecaniques "Alsthom & Cie", Paris, France

Filed Oct. 14, 1980, Ser. No. 196,680

Claims priority, application France, Oct. 18, 1979, 79 25879

Int. Cl.³ H01M *4/86*

U.S. Cl. 429—42 **17 Claims**

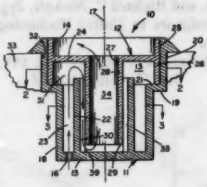


1. An electrode-collector assembly for an electric cell, said assembly comprising:

a porous electrode consisting of two layers, an active or catalytic layer and a support layer, the total thickness of said electrode being between about 50 and about 600 microns, the active or catalytic layer and the support layer each comprising 60 to 99% by weight of a hydrophobic binder and 40 to 1% by weight of a carbon-based divided electrically conductive composition, and said two layers being hydrophobic in the aggregate and intimately bonded, and

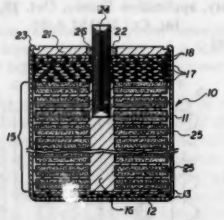
an electronically conductive collector in contact with said support layer at points or lines which are spaced apart by a distance of about 1 mm.

4,317,868
BATTERY VENT PLUG WITH FLAME ARRESTOR
Bernard N. Spiegelberg, Germantown, Wis., assignor to Gould Inc., Rolling Meadows, Ill.
Filed Sep. 19, 1980, Ser. No. 188,976
Int. Cl.³ H01M 2/12
U.S. Cl. 429—82 30 Claims



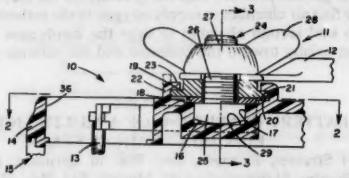
1. A vent plug for use in venting gases through an opening in a battery top wall, said vent plug comprising:
a body having an annular sidewall adapted to be fitted to the battery top wall and extend through said opening therein;
an insert fitted within said body, said body and insert defining an annular gas flow chamber; and
means defining longitudinally extending dividers for dividing said flow chamber into a plurality of narrow elongated flame-arresting gas flow passages, said means comprising wall means formed integrally with at least one of said body and insert and in fitting engagement with the other of said body and insert members.

4,317,869
BATTERY STRUCTURE
Stanford G. Folus, Randallstown, Md., assignor to Catalyst Research Corporation, Baltimore, Md.
Filed Jan. 19, 1981, Ser. No. 226,369
Int. Cl.³ H01M 4/00
U.S. Cl. 429—128 6 Claims



1. A multi-cell battery comprising
a. an encasement means having a base portion;
b. insulator means coextensively positioned on said base portion;
c. an array of cells compressively intergrated to include a central column, said cells of said array each including a lithium anode and a depolarizer having a central opening, said central column being formed from lithium extruded through said openings by compression of said cells;
d. second insulator means positioned coextensively over said array and having a central opening therethrough; and
e. a top means having a terminal pin insulatingly mounted through said top means and extending through said second insulator means into said central column, said top means being hermetically secured to said encasement means.

4,317,870
BATTERY TERMINATION STRUCTURE
Bruce A. Oellerich, Algonquin, Ill., assignor to Gould Inc., Rolling Meadows, Ill.
Filed Nov. 24, 1980, Ser. No. 209,629
Int. Cl.³ H01M 2/26
U.S. Cl. 429—161 12 Claims

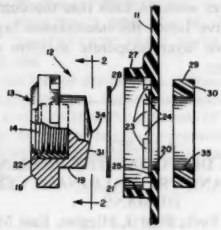


1. In a battery having a case, a termination structure comprising:
means on said case defining an outwardly opening recess;
means on said case at the outer end of said recess defining an inturned retainer;
a connector post having an inner head portion fitted in an inner portion of the recess to be retained against rotation therein, and a shank portion extending axially from said head portion to outwardly of said recess;
a wire connector having a lug portion received in said recess and inwardly engaging said head portion of the connector post, said wire connector further having a wire connecting portion extending inwardly through said case for use in providing an electrical wire connection within the battery;
a retaining collar received in said recess inwardly engaging said wire connector lug portion, and having a portion engaged by said inturned retainer; and
a clamp element secured to said connector post shank portion for clamping an electrical connector element disposed between said clamp element and said retaining collar forcibly against said retaining collar, and in turn sequentially forcibly urging the retaining collar against said lug portion of the wire connector and the lug portion against the head portion of the connector post, whereby substantially all clamping forces generated in connecting the electrical connector to the termination structure are directed between said clamp element and connector post head portion substantially without stress on the battery case.

4,317,871
BATTERY SIDE TERMINAL ASSEMBLY
Alby H. Wolf, Minneapolis, and Richard T. Strait, St. Paul, both of Minn., assignors to Gould Inc., Rolling Meadows, Ill.
Filed Mar. 26, 1980, Ser. No. 134,026
Int. Cl.³ H01M 2/30
U.S. Cl. 429—179 8 Claims

1. In a battery having a relatively thin wall, a side terminal assembly passing through the wall comprising a metal terminal insert having a head portion outside the wall and having a

body portion extending inside the wall through an aperture in the wall, and an electrically nonconductive apertured element



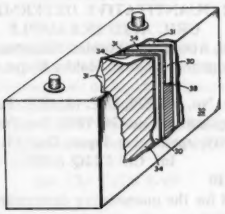
surrounding the body portion of the metal terminal insert inside the wall.

4,317,872

LEAD ACID BATTERY WITH GEL ELECTROLYTE

Brajendra P. Varma, Levittown, Pa., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Apr. 25, 1980, Ser. No. 143,967
Int. Cl.[3] H01M *6/14*
U.S. Cl. 429—190 19 Claims



1. A lead-acid battery comprising a container; a plurality of alternating positive and negative electrodes disposed in said container; separator means disposed between said electrodes and comprising a silicate component integrally mixed with an oxygen compound of boron to form a microfiber glass mat; and a gel electrolyte in substantial physical contact with said positive and negative electrodes and separators in each cell, said electrolyte comprising a sulfuric acid component and a silica component derived from an aqueous colloidal dispersion of silica particles with means causing a negative electric charge on the surface thereof to cause said particles to repel each other and catalyze the formation of siloxane cross-linkages.

14. A lead-acid battery comprising:

a. a container;

b. a plurality of alternating positive and negative electrodes disposed in said container;

c. electrode spacers disposed between said plurality of positive and negative electrodes; and

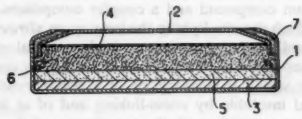
d. a gel electrolyte disposed between and in substantial physical contact with said plurality of electrodes in each cell, said electrolyte comprising a sulfuric acid component and a silica component derived from an aqueous colloidal dispersion of silica particles with means causing a negative electric charge on the surface of said particles to cause said particles to repel each other and catalyze the formation of siloxane cross-linkages.

4,317,873

ELECTRIC CELL WITH A NON-AQUEOUS ELECTROLYTE

Alain Le Mehaute, Gif sur Yvette; Jean Rouxel, Nantes, and Annie Le Blanc-Soreau, La Chapelle sur Erdre, all of France, assignors to Societe Anonyme dite Compagnie Generale D'Electricite, Paris, France

Filed Aug. 4, 1980, Ser. No. 175,327
Claims priority, application France, Sep. 11, 1979, 79 22643
Int. Cl.[3] H01M *6/14*
U.S. Cl. 429—197 12 Claims



1. An electric cell of the type which includes a positive electrode whose active material is suitable for inserting the negative active material dynamically, a negative electrode whose active material includes at least one alkali metal, and an electrolyte, wherein said positive electrode comprises at least one compound whose general formula is $MX_4R_nT_p$, where M represents an element chosen from among silicon, germanium, tin and lead, X represents sulphur, selenium or tellurium, R and T represent an element chosen from among copper, silver, manganese, iron, cobalt and nickel, n being greater than or equal to 0 and less than or equal to 4, p being greater than or equal to 0 and less than or equal to 2, wherein said compound is chosen from the group which consists of Fe_2SiS_4, Fe_2GeS_4, $Cu_2Fe_2SnS_4$, Fe_2SnS_4, Cu_2MnSnS_4, Cu_4SnS_4 and mixtures thereof.

4,317,874

SELF HEALING CATHODES

Ashok V. Joshi, Fishkill, N.Y.; Albert L. Gillotti, Churchville, and William P. Sholette, Warminister, both of Pa., assignors to Ray-O-Vac Corporation, Madison, Wis.

Filed Oct. 24, 1980, Ser. No. 200,279
Int. Cl.[3] H01M *4/60*
U.S. Cl. 429—213 5 Claims

1. A high energy density, self-healing cathode adapted for use in electrochemical cells employing an active metal anode comprising a solid or semi-solid mass containing a charge transfer complex and one or more materials existing in the solid or liquid state at ambient atmospheric temperatures and selected from the group consisting of oxide of phosphorus, oxides of boron, halides of phosphorus, halides of boron, chalcogenides of phosphorus, chalcogenides of boron, oxyhalides of phosphorus and oxyhalides of boron, said mass having a usable degree of electronic conductivity.

4,317,875

RECORDING MATERIAL CONTAINING DIAZO COMPOUNDS AND PROCESS FOR THE MANUFACTURE THEREOF

Siegfried Scheler, and Klaus Thoese, both of Wiesbaden, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 27, 1980, Ser. No. 201,040
Claims priority, application Fed. Rep. of Germany, Oct. 29, 1979, 2943632
Int. Cl.[3] G03C *1/60, 1/74, 1/80*
U.S. Cl. 430—8 6 Claims

1. A recording material which is not suitable for the production of additional copies, containing diazo compounds, in particular a microfilm comprising a film base which is at least partially pervious to visible radiation, a light-sensitive layer of an ammonia developable two component diazotype formulation of an acid-stabilized diazonium compound and a coupler

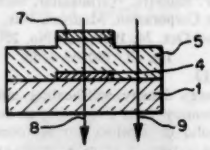
component, and, on the reverse side of the film base, a filter layer which is composed of a polymer which is insoluble or of a polymer which has been rendered insoluble by cross-linking on an adhesive promoting intermediate layer, and of at least one yellow-to orange-colored dye which is compatible with the constituents of the polymer and absorbs light in the range between about 360 nm and about 500 nm.

6. A process for the manufacture of a recording material which is not suitable for the production of additional copies containing diazo compounds, in particular a microfilm, comprising a film base which is at least partially pervious to visible radiation, a light-sensitive layer of an ammonia developable two component diazotype formulation of an acid-stabilized diazonium compound and a coupler component, and a filter layer which absorbs light in the long-wave ultraviolet spectral range and in the short-wave visible spectral range, which comprises applying the filter layer, which is composed of a polymer which is insoluble or of a polymer which is to be rendered insoluble by cross-linking and of at least one dye which is compatible with the constituents of the polymer and absorbs light in the range between about 360 nm and about 500 nm, to one side of the film base, employing an adhesion-promoting intermediate layer when applying the filter layer as a lacquer solution, the filter layer being dried and subsequently hardened, and then arranging the light-sensitive layer on the opposite side of the film base.

4,317,876
METHOD FOR PRODUCING HIGH RESOLUTION RECORDING MEDIUM

Thomas Haering, Munich, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Dec. 17, 1980, Ser. No. 217,516
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1979, 2952230
Int. Cl.³ G03C *5/00*
U.S. Cl. 430—293 **3 Claims**



1. A process for producing a high resolution recording medium comprising the following steps:
(a) providing a substrate;
(b) applying a first masking layer to the substrate;
(c) exposing a patterned portion of the first masking layer; then
(d) developing the first masking layer;
(e) applying a first reflecting layer over the remaining portion of the first masking layer;
(f) removing the remaining portion of the first masking layer and the portion of the first reflecting layer overlying the remaining portion of the first masking layer;
(g) applying a uniformly thick interference layer over the remaining portion of the first reflecting layer, said interference layer substantially absorption free in the visible portion of the spectrum;
(h) applying a second masking layer to the interference layer;
(i) exposing a patterned portion of the second masking layer; then
(j) developing the second masking layer;
(k) applying at least a second reflecting layer over the remaining portion of the second masking layer; and then
(l) removing the remaining portion of the second masking layer and the portion of the second reflecting layer overlying the remaining portion of the second masking layer;
said first and second reflecting layers and said interference layer comprising inorganic materials, the thickness of said interference layer selected such that the combination of the first reflective layer, the interference layer and the second reflective layer cooperate to form a patterned interference filter.

4,317,877
PROCESS FOR DETECTING THE PRESENCE OF MALIGNANT AND PRE-MALIGNANT CELLS IN HUMANS

M. Earl Balis, New York; Paul J. Higgins, East Meadow, and Josephine S. Salser, Yonkers, all of N.Y., assignors to Sloan Kettering Institute, New York, N.Y.

Filed Jun. 5, 1980, Ser. No. 156,827
Int. Cl.³ G01N *33/54*
U.S. Cl. 435—7 **8 Claims**

1. Process for detecting the presence of malignant and pre-malignant cells in humans which comprises:
(i) incubating an antibody to placental or tumor deoxythymidine kinase with human cells; and
(ii) detecting the presence of cells containing placental or tumor deoxythymidine kinase antigen bound to said antibody.

4,317,878
TEST COMPOSITION CONTAINING ACIDIC URICASE USED FOR QUANTITATIVE DETERMINATION OF URIC ACID IN SAMPLE

Toru Nakanishi, Atsugi, and Yoshimi Shigemasa, Machida, both of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Division of Ser. No. 103,579, Dec. 14, 1979, Pat. No. 4,273,874. This application Dec. 24, 1980, Ser. No. 219,959
Claims priority, application Japan, Dec. 14, 1978, 53-153648
Int. Cl.³ C12Q *1/62*
U.S. Cl. 435—10 **6 Claims**

1. A method for the quantitative determination of uric acid in a sample which comprises oxidizing uric acid in said sample with acidic uricase having an optimum pH in the rang of 4.7 to 5.1 in the presence of oxygen and determining colorimetrically the amount of hydrogen peroxide, carbon dioxide or allantoin formed by said reaction or determining the amount of oxygen consumed by said reaction.

4,317,879
GLUCOSE ANALYZER MEMBRANE CONTAINING IMMOBILIZED GLUCOSE OXIDASE

Michael G. Busby, Madison, and Diane E. Hartwig, Oregon, both of Wis., assignors to Airco, Inc., Montvale, N.J.

Filed May 7, 1979, Ser. No. 36,905
Int. Cl.³ C12Q *1/26, 1/54*; C12N *11/08*
U.S. Cl. 435—14 **5 Claims**

1. A composition for applying on a fluorocarbon treated to be hydrophillic to produce an immobilized glucose oxidase membrane for whole blood glucose analysis comprising:
(a) a paraformaldehyde solution comprising about 4.0% paraformaldehyde in water;
(b) a bovine serum albumin solution comprising about 5% bovine serum albumin in water; and
(c) a glucose oxidase solution comprising about 10% glucose oxidase in water;
wherein each of the components (a), (b) and (c) are mixed together in a ratio of about 1:1:1.

4,317,880

PROCESS FOR THE PRODUCTION OF FRUCTOSE POLYMERS AND HIGH FRUCTOSE SYRUPS

Robert E. Heady, Park Forest, Ill., assignor to CPC International Inc., Englewood Cliffs, N.J.

Filed Jun. 3, 1980, Ser. No. 156,154
Int. Cl.[3] C12P *19/02, 19/18, 19/24*
U.S. Cl. 435—94 12 Claims

1. A process for the preparation of fructose polymers which comprises subjecting a sucrose-containing substrate to the concurrent action of effective amounts of fructosyl transferase and glucose isomerase enzyme preparations for a time and under conditions effective to form fructose polymers, glucose and fructose.

4,317,881

PROCESS FOR PRODUCING CYCLODEXTRINS

Yoshiaki Yagi, Fujisawa; Kageaki Kouno, Tokyo, and Taiji Inui, Chigasaki, all of Japan, assignors to Sanraku-Ocean Co., Ltd., Tokyo, Japan

Filed Mar. 26, 1980, Ser. No. 134,255
Claims priority, application Japan, Apr. 7, 1979, 54/42290
Int. Cl.[3] C12N *9/10;* C12P *19/18*
U.S. Cl. 435—97 8 Claims

1. A process for producing cyclodextrins which comprises reacting starch or degraded starch as a substrate with a cyclodextrin glycosyltransferase enzyme preparation selected from the group consisting of cultured medium, cultured medium filtrate, concentrate thereof or enzyme preparation which is obtained by cultivating microorganisms belonging to genus Micrococcus capable of producing cyclodextrin glycosyltransferase, to provide cyclodextrins at a pH and a temperature effective for said reaction.

4,317,882

PRODUCTION OF PLASMINOGEN ACTIVATOR

Sadayuki Horiguchi; Akio Hasegawa, both of Fuji, and Mitsuru Shibukawa, Yokohama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 25, 1980, Ser. No. 143,680
Claims priority, application Japan, Apr. 26, 1979, 54-50819; Oct. 12, 1979, 54-131543
Int. Cl.[3] C12N *9/48*
U.S. Cl. 435—212 10 Claims

1. A process for producing plasminogen activator having a molecular weight in the range from about 45,000 to 68,000, which comprises:

(1) contacting a solution containing a carbon source and a nitrogen source with cells derived from human kidneys or lungs and having the ability to produce a plasminogen activator while maintaining the pH of said solution in a range from about 6 to 9 and the concentration of dissolved oxygen in said solution at a level of at least 30% of the saturation concentration of dissolved oxygen; and

(2) separating the resulting plasminogen activator from the solution while maintaining the pH in a range from about 4 to 12.

4,317,883

METHOD FOR OBTAINING OF GLUCOSE ISOMERASE

Mitko S. Popov; Galina M. Djedjeva; Ivan O. Todorov, and Nelly S. Stoeva, all of Sofia, Bulgaria, assignors to Institute Po Microbiologia, Sofia, Bulgaria

Filed Dec. 3, 1980, Ser. No. 212,627
Int. Cl.[3] C12N *9/92*
U.S. Cl. 435—234 2 Claims

1. A method for producing glucose isomerase comprising the steps of cultivating the enzyme producing strain Streptomyces sp. 1339 registration N.144 Bulgarian State Institute for Drug Control, for 36 to 72 hours in a culture medium with xylose as an indicator, the temperature being kept at 24° to 36° C., the initial pH of cultivation being from 6.5 to 9.0 and effective isomerization at a temperature of 50° to 80° C., and a pH of 6.0 to 9.0 in the presence of 1×10^{-4} M $CoCl_2$. $6H_2O$ 1×10^{-2} M $MgSO_4$. $7H_2O$ in 0.1 to 3 M of the substrate.

4,317,884

METHOD FOR THE PRODUCTION OF YEAST ON ETHANOL AND MEANS THEREFOR

Pasquale Zaffaroni, Mentana; Antonio Senni, Rome, and Lamberto Formiconi, Monterotondo, all of Italy, assignors to Snamprogetti S.p.A., Milan, Italy

Filed Sep. 11, 1978, Ser. No. 941,399
Claims priority, application Italy, Oct. 5, 1977, 28277 A/77
Int. Cl.[3] C12N *1/32, 1/16;* C12R *1/645, 1/72*
U.S. Cl. 435—247 6 Claims

1. A method for the production of a microbial biomass, said method comprising innoculating a culture medium which contains ethanol as the source of carbon and energy with the yeast strain NRRL-Y 11119 and aerobically incubating said culture medium.

4,317,885

MICROBIOLOGICAL PROCESS FOR REMOVING NON-IONIC SURFACE ACTIVE AGENTS, DETERGENTS AND THE LIKE FROM WASTEWATER AND MICROORGANISM CAPABLE OF SAME

James E. Blair, Roanoke, and Lois T. Davis, Salem, both of Va., assignors to Sybron Corporation, Rochester, N.Y.

Division of Ser. No. 35,045, May 1, 1979, Pat. No. 4,274,954.
This application Jun. 12, 1980, Ser. No. 158,758
Int. Cl.[3] C12N *1/20*
U.S. Cl. 435—253 1 Claim

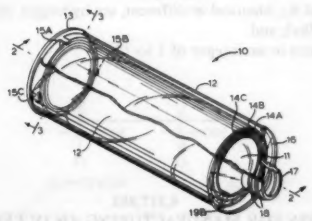
1. A biologically pure culture of the microorganism *Pseudomonas fluorescens* 3P having the identifying characteristics of ATCC-31483, said microorganism upon culturing in wastewater containing a material selected from the group consisting of anionic surface active agents, nonionic surface active agents, detergents and mixtures utilizes said material as an assimilable source of carbon.

4,317,886

MULTIPLE INTERIOR SURFACE ROLLER BOTTLE

Luther R. Johnson, Thousand Oaks, and Bruno V. Sapatino, Oxnard, both of Calif., assignors to Becton, Dickinson and Company, Paramus, N.J.

Filed Aug. 11, 1980, Ser. No. 176,936
Int. Cl.[3] C12M *3/04*
U.S. Cl. 435—285 12 Claims



1. A roller bottle for cell growth culturing comprising:

an outer substantially cylindrical housing defining a hollow chamber within and includng a liquid opening therethrough; and

a plurality of hollow discontinuous tubes positioned in said chamber and spaced substantially concentrically to each other and to the interior surface of said housing, the spaces between said tubes being in fluid communication with said chamber, the annular surfaces of said tubes and the interior surface of said housing adapted to grow cells thereon.

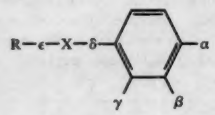
4,317,887

METAL COMPLEXING POLYMERS

Abraham Warshawsky, Rehovot; Rami Kalir, Netanya, and Abraham Patchornik, Nes Ziona, all of Israel, assignors to Yeda Research and Development Co. Ltd., Rehovot, Israel

Continuation-in-part of Ser. No. 817,806, Jul. 21, 1977, abandoned. This application Aug. 10, 1979, Ser. No. 65,751
Claims priority, application Israel, Jul. 25, 1976, 50119; Canada, Jul. 21, 1977, 283294; Fed. Rep. of Germany, Jul. 22, 1977, 2733251; South Africa, Oct. 4, 1978, 77/4290
Int. Cl.[3] B01J *45/00*
U.S. Cl. 521—38 10 Claims

1. A metal complexing polymer of the general formula



wherein

α is —OH or —SH;

β is —OH, —SH, NH_2, $—NO_2$, $—COR_1$,

or —COOH, R_1 being hydrogen, alkyl or aralkyl;

γ is hydrogen, or β and γ are linked together to form a second aromatic ring which forms a quinoline ring system in combination with the original ring;

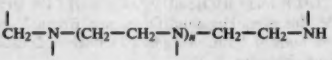
δ is $—CH_2—$ or $—SO_2—$;

R is a polymer backbone comprising polyacrylamide, polystyrene, or divinylbenzene cross-linked polystyrene;

ϵ is $—(CH_2)_n—$ or $—CH_2(OCH_2—CH_2)_n—$;

X is —NH—, $—N^+R_2R_3Cl^-—$ or —O—; or

-X-ϵ- is



wherein the upwardly directed bonds are connected to the R polymer molecule and the downwardly directed bonds are connected to δ groups;

R_2 and R_3, identical or different, are hydrogen, alkyl, aryl or aralkyl; and

n is zero or an integer of 1 to 15.

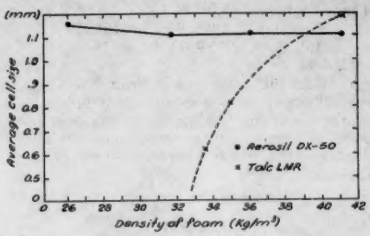
4,317,888

PROCESS FOR MANUFACTURING AN OLEFIN RESIN FOAM

Seizaburo Watanabe, Tokyo, and Tsukasa Yamagishi, Suzuka, both of Japan, assignors to Asahi-Dow Limited, Tokyo, Japan

Filed Apr. 28, 1980, Ser. No. 144,736
Int. Cl.[3] C08J *9/00*
U.S. Cl. 521—79 6 Claims

1. A process for manufacturing a polyolefin resin foam by adding to and mixing with a base polyolefin resin a cell control agent and a volatile organic blowing agent and extrusion-expanding the resultant mixture, said cell control agent comprising amorphous silica having a pH of from about 3.5 to about 4.5 in the form of nonporous microspheres with an average particle size of from about 5 to about 100 mμ and



being employed in an amount of from about 0.1 to about 5 percent by weight of the base polyolefin resin.

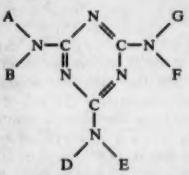
4,317,889

INTUMESCENT FLEXIBLE POLYURETHANE FOAM

Michael P. Pcolinsky, Jr., Hazleton, Pa., assignor to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed Oct. 24, 1980, Ser. No. 200,129
Int. Cl.[3] C08G *18/14, 18/38*
U.S. Cl. 521—107 28 Claims

1. In a process for the manufacture of a flexible, resilient, flame retardant and intumescent polyurethane foam from a reaction mixture comprising at least one polyester polyol, said polyester polyol being the reaction product of at least one polyhydric alcohol with at least one polycarboxylic acid or anhydride or with a lactone and having a hydroxyl functionality of greater than 2 and a molecular weight of from about 400 to about 5000; at least one organic polyisocyanate; at least one blowing agent; at least one surfactant; at least one catalyst; at least one melamine derivative of the formula



wherein A, B, D, E, F, and G are selected from the group consisting of hydrogen, methylol, and $ROCH_2—$ in which R is an alkyl radical having from 1 to 4 carbon atoms, with the proviso that in said formula at least one of A, B, D, E, F, and G is methylol or $ROCH_2—$; and at least one flame retardant selected from the group consisting of triesters of phosphoric acid, halogenated triesters of phosphoric acid, and halogenated hydrocarbons: the improvement wherein the amount of said melamine derivative is from about 10 to about 30 parts by weight per 100 parts by weight of said polyester polyol; the amount of said flame retardant is from about 20 to about 60 parts by weight per 100 parts by weight of said polyester polyol; and wherein said reaction mixture also comprises from about 50 to about 200 parts by weight per 100 parts by weight of said polyester polyol of hydrated alumina; whereby the flame retardancy and intumescent properties of said polyurethane foam are increased.

4,317,890

THERMOPLASTIC SYNTHETIC MATERIAL AND A PROCESS FOR ITS PRODUCTION

Wilhelm Goyert, Cologne; Albert Awater, Odenthal; Wolfgang Grimm; Karl-Heinz Ott, both of Leverkusen; Wolfgang Oberkirch, Cologne, and Hans Wagner, Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

Filed Dec. 13, 1979, Ser. No. 103,004

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1978, 2854407

Int. Cl.[3] C08L *75/04, 75/06*

U.S. Cl. 525—66 11 Claims

1. A thermoplastic synthetic material, comprising:

(A) 75 to 97% by weight of a thermoplastic polyurethane and

(B) 25 to 3% by weight of a polymer of olefinically unsaturated monomers,

wherein component (B) is a graft product of

(a) 12.5 to 25% by weight, based on the graft product, of one or more graft monomers on

(b) 75 to 87.5by weight, based on the graft product, of an elastomer component serving as graft base which has a second order transition temperature of below −50 C., the entire component (B) containing less than 30% by weight of the monomers styrene, α-methyl styrene and acrylonitrile.

4,317,891

THERMOPLASTIC COMPOSITION CONTAINING POLYCARBONATE, POLYAMIDE AND RUBBERY GRAFT COPOLYMER

Hajime Sakano, Hirakata; Akitoshi Ito, Yao, and Miyuki Terada, Amagasaki, all of Japan, assignors to Sumitomo Naugatuck Co., Ltd., Osaka, Japan

Filed Jul. 23, 1980, Ser. No. 171,613

Claims priority, application Japan, Jul. 24, 1979, 54/94785; Jul. 24, 1979, 54/94786

Int. Cl.[3] C08L *51/04, 69/00, 77/00*

U.S. Cl. 525—66 3 Claims

1. A thermoplastic resin composition which comprises a polycarbonate resin and a conjugated diene rubber copolymer, said conjugated diene rubber being prepared by polymerizing an aromatic vinyl compound and at least one of vinyl cyanide compounds and hydroxylated or nonhydroxylated alkyl esters of unsaturated monocarboxylic acids onto a conjugated diene rubber, in a weight propoprtion of 20:80 to 80:20 with a polyamide resin in an amount of 0.1 to 20 parts by weight on the basis of 100 parts by weight of the combined weight of the polycarbonate resin and the conjugated diene rubber copolymer.

4,317,892

BARRIER LAYER BETWEEN REACTANTS IN PHOTOGRAPHIC PRODUCTS COMPRISING A MIXTURE OF VINYLIDENE CHLORIDE TERPOLYMER AND POLYMERIC CARBOXY-ESTER-LACTONE

Edward P. Abel, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 948,062, Oct. 2, 1978, Pat. No. 4,229,516. This application Aug. 4, 1980, Ser. No. 174,960

Int. Cl.[3] C08F *8/16*

U.S. Cl. 525—194 13 Claims

1. A composition comprising a mixture of (1) from 5 to 95 percent by weight of a copolymer comprising from 55 to 85 percent by weight of vinylidene chloride, 5 to 35 percent by weight of an ethylenically unsaturated monomer and 0 to 20 percent by weight of an ethylenically unsaturated carboxylic acid, and (2) from 5 to 95 percent by weight of a polymeric carboxy-ester-lactone.

4,317,893

OIL RECOVERY BY WATERFLOODING EMPLOYING AN ANIONIC POLYMERIC SURFACTANT CONTAINING RECURRING SUCCINIMIDE OR SUCCINAMIDE GROUPS

Catherine S. H. Chen, Berkeley Heights, and Edward W. Sheppard, Lambertville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

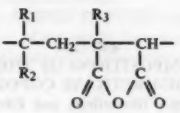
Division of Ser. No. 954,844, Oct. 26, 1978, Pat. No. 4,284,517. This application Oct. 24, 1980, Ser. No. 200,228

Int. Cl.[3] C08L *33/02*

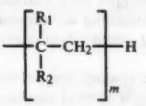
U.S. Cl. 525—328 8 Claims

1. A water-soluble, polymeric reaction product of:

(1) a polymer formed of recurring structural units of the formula



wherein R_1 and R_2 are the same or different and are hydrogen or alkyl, aryl, alkaryl or aralkyl radicals having up to 50 carbon atoms and R_3 is hydrogen or is of the formula

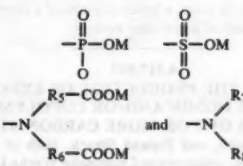


wherein R_1 and R_2 have the same meaning as hereinabove and m is from 1 to 25 and

(2) an amine of the formula

$$(Y)_n—R_4—NH_2$$

wherein n is a whole number from 1 to 3, R_4 is alkaryl, aryl, alkaryl or aralkyl containing up to 50 carbon atoms and Y is selected from the group consisting of



wherein R_5, R_6, R_7 and R_8 are alkylene radicals having up to 50 carbon atoms and M is hydrogen or substituted ammonium,

in which polymeric reaction product at least 20 mol percent of the anhydride groups have been converted by reaction with said amine to succinimide or succinamide groups, the reaction being carried out at from about 600° C. to about 180° C.

4,317,894

LOW TEMPERATURE CURE COATING COMPOSITIONS

Ronald J. Lewarchik, Natrona Heights, and Betty J. Carter, Oakmont, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 11, 1979, Ser. No. 102,491
Int. Cl.[3] C08F *283/04*
U.S. Cl. 525—455 11 Claims

6. A high solids content coating composition consisting essentially of, on a film-forming resin solids basis:

(a) from about 10 percent to about 80 percent of dicyclopentenyl-containing methacrylate;

(b) from about 5 percent to about 50 percent of polyurethane polyol;

(c) from about 5 percent to about 60 percent of trimethylolpropane monoallyl ether adipate; and

(d) a crosslinking agent, wherein the ratio of polyurethane polyol to crosslinking agent ranges from about 80:20 to about 20:80.

4,317,895

COATING COMPOSITIONS OF THERMOPLASTIC ACRYLIC-URETHANE COPOLYMERS

Matthew Guagliardo, Bloomfield, and Edward Stone, Morris Plains, both of N.J., assignors to Inmont Corporation, Clifton, N.J.

Continuation of Ser. No. 465, Jan. 2, 1979, abandoned. This application Jun. 25, 1980, Ser. No. 162,984
Int. Cl.[3] C08G *18/30;* C08F *283/04;* C08G *18/67*
U.S. Cl. 524—500 9 Claims

1. A thermoplastic coating composition comprising

(a) about 2 to about 7 parts by weight acrylic monomer, polymerized in the presence of

(b) one part by weight fully reacted hydroxy terminated polyurethane containing no terminal unsaturation

wherein said coating composition contains no free unreacted monomer.

6. A thermoplastic coating composition comprising

(a) 3 parts by weight methyl methacrylic monomer, polymerized in the presence of

(b) 1 part by weight 1,4 butanediol capped polyurethane

wherein said coating composition contains no free unreacted monomer.

4,317,896

FOUNDRY NO-BAKE COMBINATION RESIN BINDER

Melville J. Holik, Franklin Park, Ill., assignor to International Minerals & Chemical Corp., Terre Haute, Ind.

Filed Dec. 10, 1980, Ser. No. 214,828
Int. Cl.[3] C08L *61/14*
U.S. Cl. 525—501 3 Claims

1. A binder for foundry aggregate capable of being catalytically cured with a polyisocyanate and an alkaline catalyst comprising in combination as a major portion a butylated phenolformaldehyde resin, a lesser amount of a resole resin and a still lesser amount of a novolac resin.

4,317,897

PROCESS FOR THE PRODUCTION OF EXTENSIVELY AMORPHOUS HOMO- AND/OR COPOLYMERS OF α-OLEFINS OF 3 OR MORE CARBON ATOMS

Christoph Herrmann, and Roland Streck, both of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Huels, A.G., Marl, Fed. Rep. of Germany

Filed Feb. 4, 1980, Ser. No. 118,339
Claims priority, application Fed. Rep. of Germany, Feb. 21, 1979, 2906639
Int. Cl.[3] C08F *4/64, 10/04, 10/14*
U.S. Cl. 526—116 10 Claims

1. A process for the preparation of an extensively amorphous homo- or copolymer of an α-olefin of 3–32 carbon atoms comprising polymerizing an α-olefin using a titanium-containing Ziegler-Natta catalyst,

the catalyst consisting essentially of a mixture of

(A) the reaction product of

(a) a μ-oxoalkoxide of the following formula, wherein the μ-oxoalkoxide has been separated from the reaction mixture in which it was prepared,

$$Ti_xO_{(x+y-1)}M_y^m(OR^1)_{(2x+1)}Z_{(m-1)y}$$

wherein

M is a metal of valence m,

R^1 is an alkyl residue of 1–10 carbon atoms,

Z is C_{1-18} alkanoyloxy or C_{1-10} alkoxy,

x is a whole or fractional number of 1–4,

y is a whole or fractional number of 1–2, and

m is 2, 3 or 4; with

(b) a halogen-containing organoaluminum compound of the formula

$$R_n^2AlX_{3-n}$$

wherein

R^2 is C_{1-16} alkyl,

X is chlorine, bromine or iodine, and

n is a whole or fractional number of 0.5–2.5, and

(B) an aluminum trialkyl of up to 16 carbon atoms in each alkyl group.

4,317,898

CATALYST AND PROCESS FOR THE POLYMERIZATION OF OLEFINS

Nicholas M. Karayannis, Naperville, and Sam S. Lee, Hoffman Estates, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation of Ser. No. 854,830, Nov. 25, 1977, abandoned, which is a continuation of Ser. No. 609,020, Aug. 29, 1975, abandoned, which is a continuation-in-part of Ser. No. 301,112, Oct. 26, 1972, abandoned, which is a continuation-in-part of Ser. No. 222,328, Jan. 31, 1972, abandoned. This application Jan. 8, 1981, Ser. No. 223,476
The portion of the term of this patent subsequent to Apr. 13, 1993, has been disclaimed.
Int. Cl.[3] C08F *4/64, 10/06*
U.S. Cl. 526—141 5 Claims

1. In a process for preparing highly-crystalline polypropylene or pure block or terminal block types of copolymers of propylene and ethylene or propylene and another alpha-olefin using a component (a), a dialkylaluminum chloride, a mixture of from about 30 to about 70 mol% trialkylaluminum and from about 70 to about 30 mol% alkylaluminum dichloride, or a mixture of from about 20 to about 50 mol% trialkylaluminum and from about 80 to about 50 mol% dialkylaluminum chloride, and a component (b), activated titanium trichloride, the improvement which comprises admixing with components (a) and (b) a (c) component capable of reducing the production of alkane soluble products without substantial decreases in polymerization activity comprising a bis-(trialkyl)tin sulfide and 2,4,6-collidine, such that the amount of said 2,4,6-collidine runs from about one-tenth mol percent to about twenty mol percent of the amount of said component (a) present and about ten to about ninety mol percent of the amount of said (c) component.

4,317,899

PROCESS FOR PRODUCING FLUOROSILICONE POLYMERS

Ben A. Bluestein, Schenectady, and E. Robert Evans, Clifton Park, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Continuation of Ser. No. 959,544, Nov. 13, 1978, abandoned. This application Jul. 18, 1980, Ser. No. 170,272

Int. Cl.³ C08G 77/06

U.S. Cl. 528—14 8 Claims

1. A process for producing fluorosilicone polymers of a viscosity varying from 1,000,000 to 300,000,000 centipoise at 25° C. comprising the steps of:

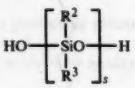
(1) reacting

(a) a fluoro-substituted cyclopolysiloxane of the formula:

$$(R\ R^1SiO)_t$$

wherein R is selected from the class consisting of alkyl radicals and phenyl radicals and R^1 is a 3,3,3-trifluoropropyl radical, and t is the integer 3; with

(b) a chainstopper of the formula:



wherein R^2 is selected from the class consisting of alkyl and phenyl radicals, R^3 is a 3,3,3-trifluoropropyl radical, and s is a whole number which varies from 2 to 50; and

(c) a basic polymerization catalyst; and

(2) neutralizing said basic polymerization catalyst.

4,317,900

ISOCYANATOMETHYL GROUP CONTAINING UREA DERIVATIVES OF 3(4), 8(9)-DIISOCYANATOMETHYLTRICYCLO [5.2.1.0^{2,6}] DECANE, METHOD FOR THEIR PRODUCTION AS WELL AS THEIR USE FOR PRODUCING POLYURETHANE ELASTOMERS

Horst Schnurbusch; Rainer Gras, and Elmar Wolf, all of Herne, Fed. Rep. of Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Kreis Recklinghausen, Fed. Rep. of Germany

Filed Jul. 30, 1980, Ser. No. 173,619

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1979, 2932646

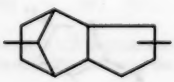
Int. Cl.³ C08G 18/10; C07C 119/045

U.S. Cl. 528—59 6 Claims

1. Urea derivatives containing isocyanatomethyl groups of 3(4), 8(9)-diisocyanatomethyltricyclo[5.2.1.0^{2,6}] decane of the formula

$$OCN—H_2C—[R—CH_2—NH—CO—NH—CH_2-]_n—R—CH_2—NCO,$$

in which R is



and n=1-5.

6. A method of producing polyurethane elastomers free of solvents comprising mixing the urea derivative containing isocyanatomethyl groups according to claim 1 with hydroxyl group-containing compounds.

4,317,901

METHOD FOR THE PRODUCTION OF A POWDERED PHENOLIC RESOLE RESIN

Harry F. Cosway, Cincinnati, Ohio, assignor to Formica Corporation, Wayne, N.J.

Filed Oct. 6, 1980, Ser. No. 194,486

Int. Cl.³ C08G 8/10

U.S. Cl. 528—139 6 Claims

1. A method for the production of a powdery, free-flowing phenol/formaldehyde condensation product which comprises:

(a) reacting formaldehyde with phenol in a molar ratio of from about 1.2 to 1 to about 1.6 to 1 respectively, in the presence of an aqueous solution of a catalyst, a surfactant and a protective colloid until a viscous, resin emulsion is formed.

(b) adding to the viscous, resin emulsion with agitation, sufficient polyvalent, catonic precipitant to cause the emulsion to pass through a muddy, grainy state to a fluid, mobile condition;

(c) fltering the resultant media,

(d) washing the resultant filter cake with at least 15 parts of water per part of dry solids therein and

(e) recovering the resultant phenol/formaldehyde condensation product.

4,317,902

SO_3-CONTAINING AROMATIC POLYAMIDES

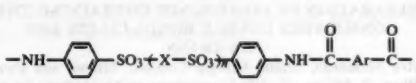
Helmuth E. Hinderer, Pensacola, Fla., assignor to Monsanto Company, St. Louis, Mo.

Filed May 19, 1980, Ser. No. 151,498

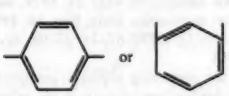
Int. Cl.³ C08G 69/32

U.S. Cl. 528—337 7 Claims

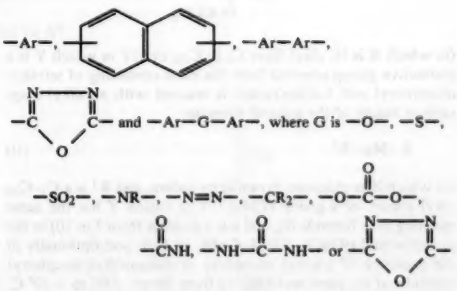
1. A fiber-forming polyamide characterized in having recurring units of the formula:



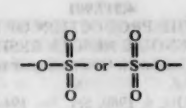
wherein n is 1 or 0, Ar is



and X is a divalent radical selected from the group consisting of



where R is H, alkyl or aryl, with the proviso that in the above formula when n is 0 the SO_3 group may be oriented



and when n is 1 the SO_3 groups are oriented in opposite directions.

4,317,903

PROCESS FOR THE PURIFICATION OF LINCOMYCIN

John R. Hofstetter, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Jan. 26, 1981, Ser. No. 228,396
Int. Cl.[3] C07H *15/16*
U.S. Cl. 536—11 6 Claims

1. A process for recovering highly pure lincomycin hydrochloride from an impure preparation comprising lincomycin A and lincomycin B which comprises (a) subjecting said impure preparation to a reverse-phase high performance preparative liquid chromatography using a bonded-phase silica gel, and (b) recovering highly pure lincomycin hydrochloride.

4,317,904

1,2-EPIMINOFORTIMICIN B

Jerry R. Martin; John S. Tadanier, both of Waukegan, and Paulette Collum, Zion, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 863,009, Dec. 21, 1979, Pat. No. 4,169,198. This application Apr. 27, 1979, Ser. No. 131,147
Int. Cl.[3] C07H *15/22*
U.S. Cl. 536—17 R 1 Claim

1. 1,2-Epiminofortimicin B.

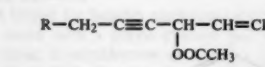
4,317,905

PREPARATION OF COMPOUNDS CONTAINING TWO CONJUGATED DOUBLE BONDS CIS-CIS AND CIS-TRANS

Pietro Massardo, Milan; Giorgio Cassani, Arluno, and Paolo Piccardi, Milan, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 941,215, Sep. 11, 1978, abandoned. This application May 21, 1979, Ser. No. 41,064
Claims priority, application Italy, Sep. 14, 1977, 27519 A/77
Int. Cl.[3] C07D *309/12*; C07C *67/14, 67/08, 41/48, 5/09, 1/36*
U.S. Cl. 542—413 4 Claims

1. A process for preparing aliphatic compounds containing two conjugated double bonds cis-cis or cis-trans, characterized in that a compound of the general formula:

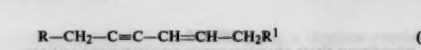


(I)

(in which R is H, alkyl from C_1 to C_{10}, or OY in which Y is a protective group selected from the class consisting of tetrahydropyranyl and 1-ethoxyethyl is reacted with an alkyl-magnesium halide of the general formula:

(II)

(in which Z is chlorine, bromine or iodine, and R^1 is a C_1–C_{10} alkyl group, or a group $(CH_2)_nOY$ in which Y has the same meaning as in formula (I), and n is a number from 3 to 10) in the presence of Li_2CuCl_4, CuCl, CuBr, or CuI, and optionally in the presence of triethyl phosphite or hexamethylphosphoryl triamide, at temperatures ranging from about −30° to +10° C. in the presence of ethyl ether or tetrahydrofuran as solvent, to obtain an aliphatic compound of the general formula:



(III)

in which the carbon atoms linked with the double bond carry two hydrogen atoms in cis position, and reducing the triple bond of (III) with lithium-aluminum hydride to produce the cis-trans compound, or reducing (III) with dialkylborane or catecholborane to produce the cis-cis compound.

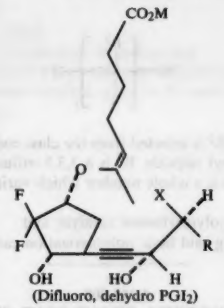
4,317,906

METHOD FOR PREPARING 10,10-DIFLUORO PROSTACYCLINS

Martin F. Haslanger, Lambertville, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

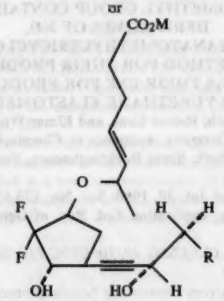
Filed Dec. 15, 1980, Ser. No. 216,598
Int. Cl.[3] C07D *307/935*
U.S. Cl. 542—426 9 Claims

1. A method for preparing a compound of the formula



(Difluoro, dehydro PGI_2)

or

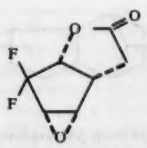


(Δ^4 isomer of Difluoro, dehydro PGI_2) wherein M is H, alkyl, haloalkyl or aralkyl;

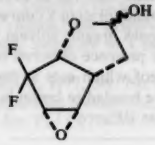
X is H or F; and

R is lower alkyl, lower alkenyl, haloalkyl or aralkyl,

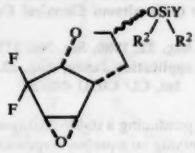
which includes the steps of reacting an epoxy lactone of the structure



with a reducing agent to form the corresponding epoxy hemiacetal of the structure



reacting the epoxy hemiacetal with a silyl protecting compound to form an epoxy silyl acetal of the structure

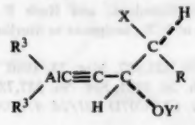


wherein

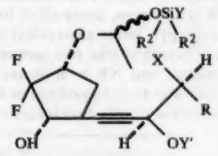
Y represents an ether protecting group, and

R^2 is lower alkyl or aryl,

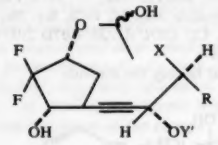
reacting the epoxy silyl acetal with an alkynyl derivative of the structure



wherein R^3 is lower alkyl, X is H or F, R is lower alkyl, lower alkenyl or aryl-lower alkyl, and Y' is an alcohol protecting group, to form the silyl acetal of the structure



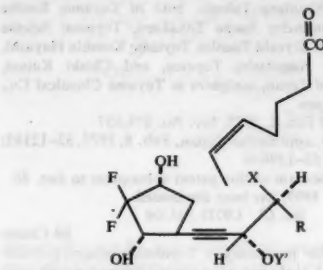
reacting the silyl acetal with a fluorine containing acid to remove the SiY' protecting group to form the hemiacetal of the structure



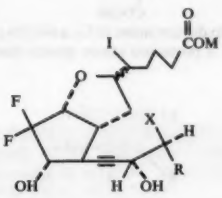
subjecting the hemiacetal to a Wittig reaction by reacting same with a triphenylphosphonoalkanoic acid salt of the structure

$$(C_6H_5)_3P{=}CH(CH_2)_3CO_2M_2$$

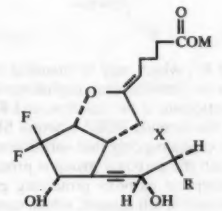
wherein M_2 is an alkali metal, and thereafter acidifying and then esterifying the resulting reaction product to form the protected difluoro-13,14-dehydro-$PGF_{2\alpha}$ compound of the structure



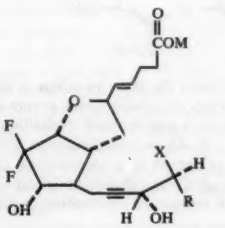
removing the Y' protecting group by treatment with a strong acid, reacting the deprotected difluoro-13,14-dehydro-$PGF_{2\alpha}$ compound with an iodine compound to form the difluoro, dehydro $PGF_{2\alpha}$ compound of the structure



and reacting the iodoether with a base to form the abovedefined difluoro, dehydro prostacyclins



and its Δ^4

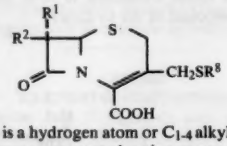


4,317,907
PROCESS FOR PRODUCING 7-(SUBSTITUTED)AMINO-3-SUBSTITUTED THIOMETHYL CEPHEM CARBOXYLIC ACIDS

Isamu Saikawa; Shuntaro Takano, both of Toyama; Kaishu Momonoi, Shinminato; Isamu Takakura, Toyama; Seietsu Kuroda, Toyama; Kiyoshi Tanaka, Toyama; Kenshin Hayashi, Tonami; Bunei Nagahashi, Toyama, and Chiaki Kutani, Funabashi, all of Japan, assignors to Toyama Chemical Co., Ltd., Tokyo, Japan

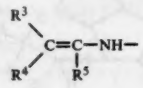
Filed Feb. 2, 1978, Ser. No. 874,637
Claims priority, application Japan, Feb. 8, 1977, 52-12182; Nov. 24, 1977, 52-139840
The portion of the term of this patent subsequent to Jan. 26, 1999, has been disclaimed.
Int. Cl.[3] C07D *501/04*
U.S. Cl. 544—21 88 Claims

1. A process for producing a 7-(substituted)amino-3-substituted thiomethyl cephem carboxylic acid represented by the formula:



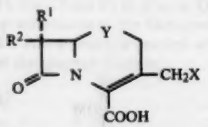
(I)

wherein R^1 is a hydrogen atom or C_{1-4} alkyloxy group; R^2 is an amino group or a protected amino group represented by the formula



in which R^3, R^4 and R^5, which may be identical or different, are hydrogen atoms or conventional cephalosporin substituents which do not participate in the reaction, or the formula

in which R^6 and R^7, which may be identical or different, are hydrogen atoms or conventional cephalosporin substituents which do not participate in the reaction; and R^8 is a moiety of a compound of the formula HSR^8 wherein SR^8 is a conventional 3-position cephalosporin thio substituent, or said compound (I) in which the carboxyl group is protected by a conventional cephalosporin carboxy protecting group or a conventional cephalosporin salt thereof, which comprises reacting a cephalosporanic acid represented by the formula:



(II)

wherein R^1 and R^2 have the same meanings as defined above; X is carboxylic acyloxy or carbamoyloxy groups or one of said groups substituted by a conventional cephalosporin substituent; >Y is >S or >S→O; or said compound (II) in which the carboxyl group is protected by a conventional cephalosporin carboxy protective group or a conventional cephalosporin salt thereof with a thiol compound represented by the formula,

R^8—SH (III)

wherein R^8 has the same meaning as defined above, or a salt thereof with a compound forming a conventional cephalosporin salt, in a non-aqueous organic solvent at a temperature of −20° to 80° C. in the presence of boron trifluoride or a complex compound thereof which acts as boron trifluoride, the boron and the fluorine bonded to boron in said complex compound being present as BF_3.

4,317,908
PROCESS FOR PRODUCING DIOXAZINE VIOLET PIGMENT

Iwao Sakaguchi, and Yoshiaki Hayashi, both of Toyonaka, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Aug. 12, 1980, Ser. No. 177,515
Claims priority, application Japan, Aug. 23, 1979, 54-108017
Int. Cl.[3] C07D *498/22*
U.S. Cl. 544—74 18 Claims

1. A process for producing a stable dioxazine violet pigment, which comprises mixing an aqueous suspension of a metastable dioxazine violet pigment with an aromatic compound having a low solubility in water, and then heating the mixture.

4,317,909
PREPARATION OF 1,3-DIHYDRO-5-(PYRIDINYL)-2H-IMIDAZO[4,5-b]PYRIDIN-2-ONES

George Y. Lesher, Schodack, and Ruth P. Brundage, East Greenbush, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 132,907, Mar. 24, 1980. This application Feb. 20, 1981, Ser. No. 237,732
Int. Cl.[3] C07D *401/14, 471/04*
U.S. Cl. 544—127 1 Claim

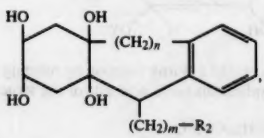
1. The process which comprises reacting 3-amino-2-RNH-6-PY-pyridine with urea or carbonyldiimidazole to produce 1,3-dihydro-3-R-5-PY-2H-imidazo[4,5-b]pyridin-2-one or with an alkali metal xanthate, thiourea or thiocarbonyldiimidazole to produce 1,3-dihydro-3-R-5-PY-2H-imidazo[4,5-b]pyridine-2-thione, where R is hydrogen, lower-alkyl, lower-hydroxyalkyl, 2,3-dihydroxypropyl, lower-alkoxyalkyl or Y-NB where Y is lower-alkylene having at least two carbon atoms between its connecting linkages and NB is di-(lower-alkyl)amino or 4-morpholinyl, and PY is 4- or 3-pyridinyl or 4- or 3-pyridinyl having one or two lower-alkyl substituents.

4,317,910
BENZO-CYCLITOLAMINES

Frederic P. Hauck, Bridgewater, and Joyce Reid, Dayton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 888,128, Mar. 20, 1978, Pat. No. 4,127,717. This application Aug. 14, 1978, Ser. No. 933,227
Int. Cl.[3] C07C *87/28;* C07D *295/10*
U.S. Cl. 544—154 9 Claims

1. A compound having the formula



wherein R_2 is dialkylamino, 1-pyrrolidinyl, 1-piperidinyl, 4-alkyl-1-piperazinyl or 4-morpholinyl; n is 1 or 2; and m is 2, 3 or 4 wherein the term "alkyl" refers to groups having 1 to 6 carbon atoms.

4,317,911

PIPERIDINE CONTAINING CYANURIC ACID DERIVATIVES

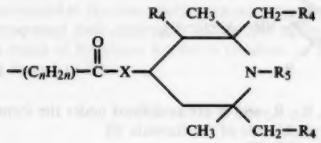
Michael Rasberger, Riehen, and Friedrich Karrer, Zofingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 1, 1977, Ser. No. 812,295
Claims priority, application Switzerland, Jul. 8, 1976, 8776/76
Int. Cl.[3] C07D *401/74*
U.S. Cl. 544—222 14 Claims

1. A compound of the formula I

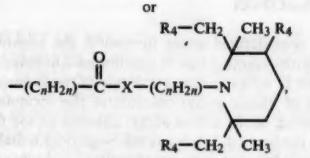
(I)

or an addition salt thereof,
in which R_1 is



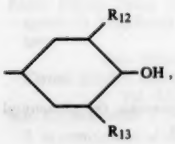
(IIa)

or



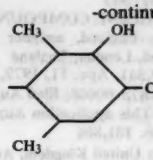
(IIb)

and R_2 and R_3 independently of one another are hydrogen, a group of the formula IIa or IIb or addition salts thereof, or $-CH_2R_{11}$, wherein n is 1, 2, 3, 4 or 5, R_4 is hydrogen or C_1–C_8 alkyl and R_5 is hydrogen, oxyl, C_1–C_{12} alkyl, C_3–C_6 alkenyl, C_3–C_4 alkinyl, C_2–C_{21} alkoxyalkyl, C_7–C_9 aralkyl, 2,3-epoxypropyl, an aliphatic acyl group with 1–4 C atoms or one of the groups $-CH_2COOR_6$, $-CH_2-CH(R_7)-OR_8$, $-COOR_9$ or $-CONHR_9$, wherein R_6 is C_1–C_{12} alkyl, C_3–C_6 alkenyl, phenyl, C_7–C_8 aralkyl or cyclohexyl, R_7 is hydrogen, methyl or phenyl, R_8 is hydrogen, an aliphatic, aromatic, araliphatic or alicyclic acyl group with 1–18 C atoms, wherein the aromatic part is unsubstituted or is substituted by at least one member of the group chlorine, C_1–C_4 alkyl, C_1–C_8 alkoxy and hydroxyl, and R_9 is C_1–C_{12} alkyl, cyclohexyl, phenyl or benzyl and X is —O— or $-NR_{10}-$ wherein R_{10} is hydrogen or C_1–C_{12} alkyl, and R_{11} is one of the groups

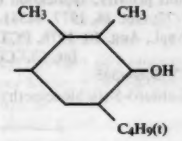


(III)

-continued



(IV)



(V)

wherein R_{12} and R_{13} independently of one another are C_1–C_{12} alkyl, C_5–C_{12} cycloalkyl, C_7–C_9 aralkyl or C_7–C_{12} alkaryl.

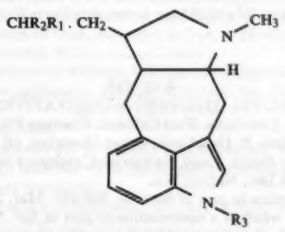
4,317,912

TETRACYCLIC INDOLE DERIVATIVES

Aldemio Temperilli; Sergio Mantegani; Giuliana Arcari, and Anna M. Caravaggi, all of Milan, Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

Filed Mar. 11, 1980, Ser. No. 129,333
Claims priority, application United Kingdom, Mar. 16, 1979, 09281/79
Int. Cl.[3] A61K *31/40, 31/445, 31/535;* C07D *487/00*
U.S. Cl. 546—199 24 Claims

1. A compound of the formula (I):



wherein

R_1 represents a hydrogen atom, or a carboxy, alkoxycarbonyl, piperidinocarbonyl, 1-pyrrolidinylcarbonyl, morpholinocarbonyl, carbamoyl or benzylcarbamoyl group, or an alkylcarbamoyl or dialkylcarbamoyl group in which the, or each, alkyl group has from 1 to 4 carbon atoms;

R_2 represents a hydrogen or fluorine atom, or a cyano, acetyl or carbamoyl group; and

R_3 represents a hydrogen atom or a methyl group; and represents a single or a double bond, with the provisos that R_1 and R_2 do not simultaneously represent hydrogen atoms, when R_1 is hydrogen, R_2 is acetyl and when R_2 is hydrogen R_1 is not hydrogen, carboxy, alkoxycarbonyl, or carbamoyl;

or a pharmaceutically acceptable salt thereof.

4,317,913
HERBICIDAL PYRIDINE COMPOUNDS

David Cartwright, Woodley, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 29,341, Apr. 11, 1979, which matured from PCT No. PCT/GB78/00008, filed Aug. 10, 1978, 102(e) date, Apr. 11, 1979. This application Aug. 27, 1980, Ser. No. 181,806

Claims priority, application United Kingdom, Aug. 12, 1977, 34039/77; Oct. 26, 1977, 44541/77; Feb. 9, 1978, 5230/78; PCT Int'l Appl., Aug. 10, 1978, PCT/GB78/00008

Int. Cl.³ C07D *213/26*

U.S. Cl. 546—345 1 Claim

1. 2-chloro-5-trichloromethylpyridine.

4,317,914
OXAZOLINES

Karl Bernauer, Oberwil, and Karlheinz Pfoertner, Basel, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

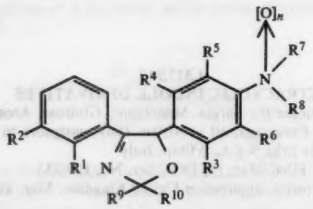
Filed Dec. 12, 1980, Ser. No. 215,965

Claims priority, application Switzerland, Dec. 21, 1979, 11410/79; Oct. 21, 1980, 7856/80

Int. Cl.³ C07D *263/10*; A61K *31/42*

U.S. Cl. 548—239 7 Claims

1. A compound of the formula



I

wherein R^1 and R^2, independently, are hydrogen, halogen or lower alkyl; R^3, R^4, R^5, R^6 and R^7, independently, are hydrogen or C_{1-3} alkyl; R^8 is hydrogen, lower alkyl or formyl; R^9 and R^{10}, independently, are methyl or trifluoromethyl; and n is 0 or, when both R^7 and R^8 are lower alkyl, n is 0 or 1.

4,317,915
NOVEL THIOPHENE DERIVATIVES

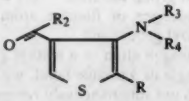
Pasquale N. Confalone, West Caldwell; Giacomo Pizzolato, Glen Ridge; Milan R. Uskokovic, Upper Montclair, all of N.J., and Marianne Rouge, Basel, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 889,459, Mar. 23, 1978, abandoned, which is a continuation-in-part of Ser. No. 820,521, Aug. 1, 1977, abandoned, which is a continuation-in-part of Ser. No. 716,853, Aug. 23, 1976, abandoned. This application Jan. 14, 1980, Ser. No. 111,637

Int. Cl.³ C07D *333/16*; A61K *31/38*

U.S. Cl. 549—68 18 Claims

1. A compound of the formula:



I

wherein R is lower alkyl; R_2 is hydroxy or lower alkoxy; R_3 and R_4 individually are lower alkyl or hydrogen; or a pharmaceutically acceptable salt thereof.

4,317,916
PROCESS FOR PRODUCING N-SUBSTITUTED-N-ACETYL-2,6-DIALKYL-ANILINES

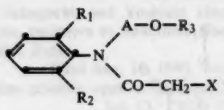
Gerhard Degischer, Füllinsdorf, and Werner Angst, Muttenz, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 30,574, Apr. 16, 1979, abandoned. This application Sep. 4, 1980, Ser. No. 183,871

Int. Cl.³ C07C *102/00*, *67/00*

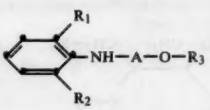
U.S. Cl. 560—43 8 Claims

1. In a process for producing N-substituted-N-acetyl-2,6-dialkylanilines of the formula I



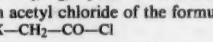
(I)

in which R_1 and R_2 independently of one another are each methyl or ethyl, A is a 1,2-ethylene group which can be substituted by 1 or 2 methyl groups, or a 2-oxo-1,2-ethylene group which can be substituted by 1 or 2 methyl groups, R_3 is an alkyl group having 1 to 3 carbon atoms, and X represents chlorine or an alkoxy group having 1 to 3 carbon atoms, by reacting an N-substituted-2,6-dialkylaniline of the formula II



(II)

in which R_1, R_2, R_3 and A are as defined under the formula I, with an acetyl chloride of the formula III



(III)

in which X is as defined under formula I, the improvement which comprises reacting the N-substituted-2,6-dialkylaniline of the formula II with the acetyl chloride of the formula III in the presence of excess acetyl chloride of the formula III as solvent, distilling of the excess acetyl chloride of the formula III, washing the formed N-substituted-N-acetyl-2,6-dialkylaniline of the formula I with water until neutral, and subsequently drying the product.

4,317,917
DERIVATIVES OF METHYL-SUBSTITUTED OR METHOXY-SUBSTITUTED 2-HYDROXYBENZOIC ACIDS, AND PHARMACEUTICAL FORMULATIONS CONTAINING THEM

Leonardo De Vincentiis, Pomezia, Italy, assignor to Ausonia Farmaceutici S.r.l., Rome, Italy

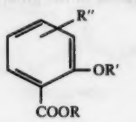
Filed Mar. 21, 1980, Ser. No. 132,517

Claims priority, application Italy, May 17, 1979, 22739 A/79

Int. Cl.³ C07C *69/88*

U.S. Cl. 560—72 9 Claims

1. Derivatives of methyl-substituted or methoxy-substituted 2-hydroxybenzoic acids of general formula (I)



(I)

in which:

R represents hydrogen, and R′ represents the cinnamoyl residue (3-phenyl-2-propenoyl); or

R represents cinnamyl (3-phenyl-2-propenyl), and R′ represents hydrogen; and

R″ represents CH_3 or OCH_3.

4,317,918

PROCESS FOR PREPARING ALCOHOLS

Tetsuo Takano; Gohu Suzukamo; Masaru Ishino, all of Osaka, and Kiyoshi Ikimi, Kyoto, all of Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Filed Nov. 3, 1980, Ser. No. 203,486

Claims priority, application Japan, Nov. 5, 1979, 54/143549; Nov. 21, 1979, 54/151762; Nov. 26, 1979, 54/153225

Int. Cl.³ C07C *29/136, 31/02, 33/34, 33/46, 51/10*

U.S. Cl. 562—406 12 Claims

1. A process for preparing an alcohol from the corresponding carboxylic acid by reducing said carboxylic acid with hydrogen in the presence of a rhenium catalyst, characterized in that at least one organic base selected from the group consisting of organic amines and organic phosphines is present in the reaction system.

11. A process for preparing a carboxylic acid of of the formula: Ar—CH_2—COOH wherein Ar is a substituted or unsubstituted, monocyclic or condensed polycyclic, aromatic hydrocarbon group by reacting the corresponding aldehyde of the formula: Ar—CHO wherein Ar is as defined above with carbon monoxide and water in the presence of a catalyst system, characterized in that the catalyst system comprises rhodium or its compound with hydrogen iodide, the molar ratio (gram atom ratio) of hydrogen iodide to rhodium or its compound being from 1 to 10.

4,317,919

RECOVERY OF BROMINE FROM EFFLUENT GASES IN THE OXIDATION OF SUBSTITUTED AROMATICS TO FORM AROMATIC CARBOXYLIC ACIDS

Peter J. Jones, Billingham, and David J. Royall, Guisborough, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Dec. 19, 1979, Ser. No. 105,303

Claims priority, application United Kingdom, Dec. 21, 1978, 49614/78

Int. Cl.³ C07C *51/29*

U.S. Cl. 562—414 3 Claims

1. In a process for the oxidation of a substituted aromatic compound to an aromatic carboxylic acid by means of molecular oxygen in a lower monocarboxylic acid solvent and in the presence of a catalyst comprising a heavy metal compound and bromine or a bromine-containing compound

the improvement wherein the effluent gases from the oxidation process contain methyl bromide and are contacted with activated carbon for the absorbtion of said methyl bromide which is thereafter recovered from the activated carbon.

4,317,920

ARYLACETIC ACID DERIVATIVES

Endre Palosi; Dezsö Korbonits, , assignors to Chinoin Gyógyszer és Vegyészeti Termékek Gyára Rt., Budapest, Hungary

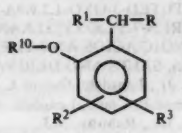
Filed May 21, 1979, Ser. No. 41,106

Claims priority, application Hungary, May 23, 1978, CI 1829

Int. Cl.³ C07C *131/00, 125/06*

U.S. Cl. 562—440 3 Claims

1. A compound of the formula:



wherein

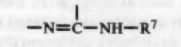
R^1 is hydrogen, methyl or ethyl;

R^2 is hydrogen, fluoro or alkyl having 1 to 4 carbon atoms;

R^3 is hydrogen, phenyl, alkoxy having 1 to 6 carbon atoms, phenoxy, thenoyl or benzoyl; or

R^2 and R^3 together with the phenyl group to which they are attached form a naphthyl group which is unsubstituted or substituted by C_1 to C_4 alkyl or C_1 to C_4 alkoxy;

R^{10} is phenylaminocarbonyl, 1-phenyl-5-tetrazolyl, a group —SO_2Me, wherein Me is a metal atom selected from the group which consists of sodium and potassium, or a group —SO_2—R^6, in which R^6 is alkyl having 1 to 4 carbon atoms, 4-methylphenyl, amino, C_1 to C_4 alkoxycarbonylamino, benzoylamino or a group R^7



in which R^7 is cycloalkyl having 5 or 6 carbon atoms; and

R is carboxyl.

3. 2-(N,N′-dicyclohexyl-isocarbamido)-4-methyl-hydratropic acid.

4,317,921

PRODUCTION OF RADIOIODINATED T_3 AND T_4

Max G. Reese, Salt Lake City, and Richard H. Hales, West Jordan, both of Utah, assignors to Becton Dickinson & Company, Paramus, N.J.

Division of Ser. No. 879,800, Feb. 21, 1978, Pat. No. 4,192,858. This application Apr. 25, 1979, Ser. No. 33,123

Int. Cl.³ C07C *99/00*

U.S. Cl. 562—444 2 Claims

1. In a process for producing radioiodinated T_3 by radioiodinating T_3 with $Na^{125}I$ in the presence of chloramine T, the improvement comprising:

effecting said radioiodination at a pH of from 8 to 9 and an amount of T_3 and radioiodinated sodium to provide a T_3 to radioiodine mole ratio of from 2.5:1 to 7:1 to produce a product containing radioiodinated T_3 of medium specific activity in the order of from 200 to 500 m Ci/mg and which maintains antigenic activity, the ratio of radioiodinated T_3 in the product to radioiodinated T_4 being from 2:1 to 4:1.

2. In a process for producing radioiodinated T_4 by radioiodinating T_4 with $Na^{125}I$ in the presence of chloramine T, the improvement comprising:

effecting said radioiodinating at a pH of from 8 to 9 and an amount of T_4 and radioiodinated sodium to provide a T_4 to radioiodine mole ratio of from 2.5:1 to 6:1 to produce a product containing radioiodinated T_4 of medium specific activity in the order of 100 to 500 m Ci/mg and which maintains antigenic activity, the ratio of radioiodinated T_4 to radioiodinated T_3 being at least 3:1.

4,317,922
[(5,6,9A-SUBSTITUTED-3-OXO-1,2,9,9A-TETRAHYDRO-3H-FLUOREN-7-YL)OXY]ALKANOIC AND CYCLOALKANOIC ACIDS AND THEIR ANALOGS, ESTERS, SALTS AND DERIVATIVES

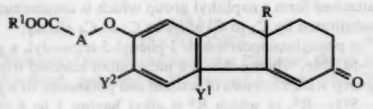
Edward J. Cragoe, Jr., Lansdale; Gerald E. Stokker, Gwynedd Valley, and Norman P. Gould, Lansdale, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 86,627, Oct. 19, 1979, abandoned, and a continuation-in-part of Ser. No. 164,706, Jun. 30, 1980. This application Feb. 19, 1981, Ser. No. 236,081

Int. Cl.³ C07C *69/94*

U.S. Cl. 562—461 15 Claims

1. A compound of the formula:



wherein R is phenyl and phenyl C_1 to C_4 where the alkyl is branched or unbranched; R^1 is H, lower alkyl, such as methyl, ethyl, propyl, isopropyl, butyl, isobutyl, tert.-butyl and the like; lower alkenyl, such as, vinyl, allyl, 2-butenyl and the like; lower alkynyl, such as propargyl, butynyl and the like; lower cycloalkyl, such as cyclobutyl, cyclopentyl and the like; substituted lower allyl, where the substituent is carboxy, lower alkoxycarbonyl, oxo, hydroxy, lower alkoxy, halo, lower acyloxy, lower dialkylamino, sulfamoyl, pyridyl, furyl, tetrahydrofuryl, aryl 1-methylpiperidyl, morpholinyl, pyrrolidinyl, 1-methylpiperazinyl, thienyl, and the like; substituted cycloalkyl such as, carboxycycloalkyl, and the like; heterocyclic, such as imidazolyl, pyridyl, thiazolyl, pyrazinyl, furyl, and the like; aryl, such as phenyl, carboxyphenyl hydroxymethylphenyl and the like; Y^1 and Y_2 are independently Cl and CH_3; A is $(CH_2)_2$ or

where R^2 is H, methyl or ethyl, R^3 is H, F or methyl and R^2 and R^3, may be joined together to form the ring $>C(CH_2)_n$ where n is the integer 2, 3, or 4; and pharmaceutically acceptable salts thereof.

4,317,923
PURIFICATION OF DICARBOXYLIC AROMATIC ACIDS

Tamotsu Imai, Mount Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 69,019, Aug. 23, 1979, abandoned. This application Sep. 19, 1980, Ser. No. 189,386

Int. Cl.³ C07C *51/42*

U.S. Cl. 562—487 9 Claims

1. A process for the purification of an acid selected from the group consisting of phthalic, isophthalic, and terephthalic acids containing paracarboxybenzaldehyde as an impurity, which comprises contacting said acid in an aqueous medium with a catalyst comprising metallic rhenium at a temperature of from about 150° to about 350° C. to effect decarbonylation of said paracarboxybenzaldehyde and recovering the thus purified acid.

4,317,924
PROCESS FOR PRODUCING PURIFIED TEREPHTHALIC ACID

Raymond M. Cahen, Brussels, Belgium, assignor to Labofina S.A., Brussels, Belgium

Continuation of Ser. No. 7,286, Jan. 29, 1979, abandoned. This application Apr. 23, 1980, Ser. No. 143,141

Claims priority, application United Kingdom, Feb. 8, 1978, 05091/78

Int. Cl.³ C07C *51/42*

U.S. Cl. 562—487 12 Claims

1. A process for producing purified terephthalic acid from crude terephthalic acid which is contaminated by impurities capable of undergoing reduction-oxidation reactions, which comprises the steps of:

(a) preparing an aqueous reaction mixture comprising the crude terephthalic acid suspended in an aqueous solution of a reduction-oxidation-reaction-enhancing amount of a water-soluble salt of a heavy metal selected from the group consisting of cobalt, manganese, iron, nickel and mixtures thereof wherein the reduction-oxidation-reaction-enhancing amount is an amount from about 25 to about 1000 ppm by weight of heavy metal relative to the weight of dry crude terephthalic acid;

(b) treating the aqueous reaction mixture in the presence of a catalyst comprising a noble metal of Group VIII of the Periodic System on a catalyst support which is substantially insoluble in the reaction mixture with a gas, which comprises nitrogen or a mixture of nitrogen and hydrogen having a sufficiently low partial hydrogen presshre to essentially not cause reduction of the terephthalic acid, at a sufficiently elevated reaction temperature to maintain the terephthalic acid substantially dissolved in the aqueous solution, and under a sufficiently elevated total pressure to maintain the aqueous solution in a liquid phase; and

(c) recovering purified terephthalic acid from the reaction mixture.

4,317,925
PROCESS FOR THE PRODUCTION OF DI-N-PROPYLACETIC ACID

Jürgen Weber, Oberhausen; Wolfgang Bernhagen, Mulheim/-Ruhr, and Helmut Springer, Oberhausen, all of Fed. Rep. of Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Filed Jul. 25, 1979, Ser. No. 60,559

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1978, 2844636

Int. Cl.³ C07C *51/235, 53/128*

U.S. Cl. 562—531 3 Claims

1. A process for the preparation of di-n-propylacetic acid which comprises the steps of:

A. converting n-valeraldehyde-diallyl acetal into allyl-1-pentenyl ether by cleaving one mol of allyl alcohol per one mol of n-valeraldehyde-diallyl acetal at a temperature of 120° to 200° C.;

B. rearranging the allyl-1-pentenyl ether so formed by heating the same at a temperature of 250° to 350° C. to convert the same into 2-propyl-pent-4-en-1-al;

C. partially hydrogenating the 2-propyl-pent-4-en-1-al catalytically to form 2-propyl-valeraldehyde and

D. oxidizing the 2-propyl-valeraldehyde at 20° to 60° C. by contacting the same with an oxygen-containing gas.

4,317,926
PROCESS FOR PREPARING AND RECOVERING ACRYLIC ACID

Takahisa Sato; Masao Baba, and Michito Okane, all of Himeji, Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Filed Jan. 15, 1979, Ser. No. 3,405
Claims priority, application Japan, Jan. 19, 1978, 53-3753; Jan. 20, 1978, 53-4346
Int. Cl.³ C07C *51/25, 51/50, 57/05, 57/055*
U.S. Cl. 562—532 10 Claims

1. A process for preparing acrylic acid comprising:
(a) catalytic vapor phase oxidation of an olefinic compound of the general formula CH_2=CHX wherein X represents at least one group selected from the group consisting of CH_3 and CHO with a molecular oxygen containing gas to yield a reaction product gas comprising acrylic acid and acetic acid,
(b) contacting said reaction product gas with water in the presence of hydroquinone and obtaining an aqueous solution of said reaction product and hydroquinone,
(c) separating the acrylic acid from the aqueous solution, which comprises the steps of
(i) separating the organic components containing said reaction product and hydroquinone from the aqueous solution by extraction.
(ii) separating acetic acid from the organic components to obtain the crude acrylic acid by distillation, and
(iii) separating the acrylic acid from the crude acrylic acid and obtaining a bottom liquor containing acrylic acid, acrylic acid dimer, hydroquinone and high boiling substances by distillation,
(d) decomposition evaporating said bottom liquor under reduced pressure of 20–500 mmHg at a temperature of 120°–220° C. to provide a distillate and an evaporation residue having the composition of 1–25 wt % of acrylic acid, 9–49 wt % of acrylic acid dimer, wherein the total amount of the acrylic acid and its dimer is in the range of 10–50 wt % and correspondingly 90–50 wt % of the other components, said distillate being recycled to step c, and
(e) subjecting said evaporation residue to water extraction to separate said acrylic acid, acrylic acid dimer, and hydroquinone as aqueous solution from high boiling water insoluble substances, said aqueous solution being recycled to the step b or step c-i.

4,317,927
PROCESS FOR THE CATALYTIC CONVERSION OF OLEFINICALLY UNSATURATED ALDEHYDES TO THEIR CORRESPONDING ACIDS

Charles A. Dalton, and William E. Slinkard, both of Nueces, Tex., assignors to Celanese Corporation, New York, N.Y.

Division of Ser. No. 42,754, May 29, 1979, Pat. No. 4,251,393.
This application Sep. 15, 1980, Ser. No. 187,020
Int. Cl.³ C07C *51/235*
U.S. Cl. 562—535 6 Claims

1. In a process for the catalytic conversion of olefinically unsaturated aldehydes to the corresponding unsaturated acids comprising reacting in the gas phase, said olefinically unsaturated aldehydes with oxygen at temperatures in the range from about 250° C. to about 420° C., the improvement comprising using a catalyst having improved attrition resistance comprising:
(A) an essentially inert porous support capable of holding finely divided catalytically active material on its outer surface, said support wetted with a sufficient amount of aqueous silica sol containing from about 20 to about 40 weight percent silica to provide a support which contains up to the maximum amount of silica sol said support can sorb without having the appearance of liquid on the outer surface of said support; and
(B) a finely divided catalytically active oxide material for the oxidation conversion of olefinically unsaturated aldehydes to the corresponding unsaturated acids, completely calcined at temperatures in the range from about 360° C. to about 420° C.;
said finely divided catalytically active oxide material having been coated onto the surface of said wetted porous support in a manner to provide a uniform-appearing coating and the resulting catalyst dried, said catalyst product having a special attrition index not exceeding 5 weight percent.

4,317,928
N,N,N',N'-TETRAKIS(2-FLUORO-2,2-DINITROETHYL) OXAMIDE AND A METHOD OF PREPARATION THEREOF

Michael E. Sitzmann, Adelphi, and William H. Gilligan, Ft. Washington, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 23, 1981, Ser. No. 228,032
Int. Cl.³ C07C *103/14, 133/02*
U.S. Cl. 564—160 1 Claim

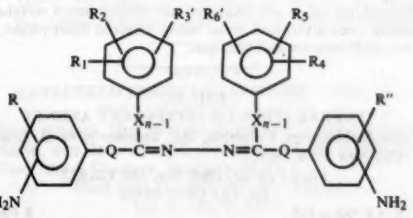
1. N,N,N',N'-tetrakis(2-fluoro-2,2-dinitroethyl)oxamide.

4,317,929
TETRAPHENYLKETAZINES AND ISOINDOLINONE PIGMENTS OBTAINED THEREFROM

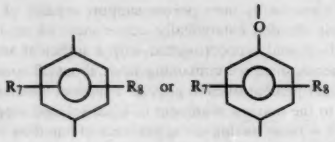
Ernst Model, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 7,549, Jan. 30, 1979, Pat. No. 4,231,931.
This application May 27, 1980, Ser. No. 153,482
Claims priority, application Switzerland, Feb. 3, 1978, 1215/78
Int. Cl.³ C07D *119/00*
U.S. Cl. 564—249 2 Claims

1. An amine of the formula



wherein R and R'' represent hydrogen, halogen, methyl or methoxy, R_1, R_2, R_4 and R_5 represent hydrogen, chlorine, bromine or alkyl of 1 to 2 carbon atoms, R_3' and R_6' represent hydrogen, halogen, alkyl or alkoxy groups of 1 to 2 carbon atoms, or amino, Q is a direct bond or p-phenylene, n is 1 or 2 and X represents a group of the formula



wherein R_7 and R_8 represent hydrogen, chlorine or methyl and the O of the phenoxy group is attached to the phenyl ring of said amine.

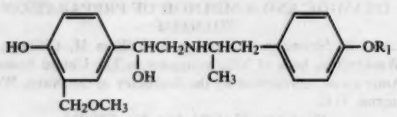
4,317,930

PHENETHYLAMINE DERIVATIVES AND BRONCHDILATOR CONTAINING THE SAME

Noriyasu Hirose, Kokubunji, and Shigeru Souda, Tokyo, both of Japan, assignors to Eisai Co., Ltd., Japan

Filed Mar. 16, 1977, Ser. No. 778,326
Claims priority, application Japan, Mar. 19, 1976, 51/29175
Int. Cl.³ C07K *91/16*
U.S. Cl. 564—363 **4 Claims**

1. A phenethylamine derivative represented by the formula:



wherein R_1 is hydrogen or methyl, or a pharmacologically acceptable acid-addition salt thereof.

4,317,931

PROCESS FOR REARRANGEMENT OF ALKYL GROUPS ON AROMATIC AMINES

John C. Wollensak, Bloomfield Hills; Kryn G. Ihrman, Farmington, and Chester P. Jarema, Sterling Heights, all of Mich., assignors to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 72,931, Sep. 6, 1979, abandoned. This application Mar. 5, 1981, Ser. No. 240,752
Int. Cl.³ C07C *85/24*
U.S. Cl. 564—409 **11 Claims**

1. A process for redistributing methyl groups on nuclear methyl-substituted aromatic amines, said process comprising heating an aromatic amine or mixture of aromatic amines, said aromatic amine or mixture of aromatic amines containing (a) aromatic amine having at least one o-methyl substituent and (b) aromatic amine having at least one ortho position unsubstituted except for hydrogen, at a temperature of about 100°–500° C. in the presence of an aluminum anilide catalyst and a metal-containing cocatalyst, said metal being selected from nickel, cobalt, molybdenum and titanium.

4,317,932

PREPARATION OF SECONDARY AMINES

Felek Jachimowicz, Columbia, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed Feb. 22, 1980, Ser. No. 123,822
Int. Cl.³ C07C *85/18*
U.S. Cl. 564—445 **8 Claims**

1. A process of forming secondary amino compounds comprising contacting, in a reaction zone, an inert liquid media, an olefinic compound, carbon monoxide, ammonia and water as the hydrogen source at a temperature of from about 50° to 250° C. and at a pressure of from about 30 to about 300 atmospheres in the presence of a catalytic amount of a catalyst consisting essentially of a rhodium atom containing compound selected from metallic rhodium, rhodium salts, rhodium carbonyls, rhodium oxides and ligands thereof; and recovering the formed secondary amine product.

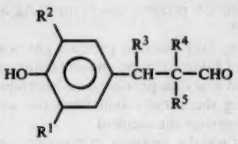
4,317,933

PREPARATION OF ANTIOXIDANTS

Dane K. Parker, Canton, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

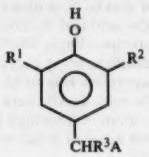
Division of Ser. No. 435,568, Jan. 22, 1974, Pat. No. 4,091,225. This application Nov. 9, 1977, Ser. No. 849,828
Int. Cl.³ C07C *47/56*
U.S. Cl. 568—433 **3 Claims**

1. A compound having the general formula



wherein R^1 and R^2 are the same or different radicals selected from the group consisting of tertiary alkyl radicals having from 4 to 12 carbon atoms, R^3 is selected from the group consisting of hydrogen and alkyl radicals having from 1 to 20 carbon atoms and R^4 and R^5 are the same or different radicals selected from the group consisting of alkyl radicals having from 1 to 10 carbon atoms, alkylene radicals having from 2 to 10 carbon atoms and aryl radicals having from 6 to 12 carbon atoms.

2. A process comprising reacting compounds having the general structural formula

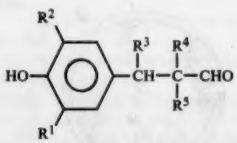


(I)

with compounds having the general structural formula

(II)

reacting in the presence of a basic catalyst while dissolved in benzene solvent to yield aldehydes having the structural formula



(III)

wherein R^1 and R^2 are the same or different radicals selected from the group consisting of tertiary alkyl radicals having from 4 to 12 carbon atoms, R^3 is selected from the group consisting of hydrogen, alkyl radicals having from 1 to 20 carbon atoms, and A is selected from the group consisting of chloro, bromo, and iodo, R^4 and R^5 are the same or different radicals selected from the group consisting of alkyl radicals having from 1 to 10

carbon atoms, alkylene radicals having from 2 to 10 carbon atoms, and aryl radicals having from 6 to 12 carbon atoms.

4,317,934

PREPARATION OF CARBONYL COMPOUNDS

Paul D. Seemuth, Oak Park, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed Aug. 15, 1980, Ser. No. 178,460
Int. Cl.³ C07C *45/28, 45/43*
U.S. Cl. 568—437 **8 Claims**

1. In a process for selectively producing an aldehyde by a procedure which comprises hydrolyzing a geminal dihalide containing a monohalide impurity to form a mixture of an aldehyde and an alcohol, the improvement comprising further reacting said mixture with manganese dioxide to convert said alcohol to additional aldehyde thereby eliminating the need for a separation procedure to remove said alcohol.

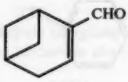
4,317,935

BICYCLO ALDEHYDE AND PROCESS FOR PREPARATION

Kyriacos C. Nicolaou, Havertown, Pa.; Ronald L. Magolda, Vineland, N.J., and David A. Claremon, Philadelphia, Pa., assignors to Research Corporation, New York, N.Y.

Division of Ser. No. 87,678, Oct. 24, 1979, Pat. No. 4,260,806.
This application Oct. 6, 1980, Ser. No. 194,399
Int. Cl.³ C07C *47/44, 45/27*
U.S. Cl. 568—445 **2 Claims**

1. An intermediate useful for the synthesis of carbocyclic thromboxane, having the formula:



4,317,936

HYDROFORMYLATION PROCESS USING RESIN-LIGAND-METAL CATALYST

Leo Kim; Timm E. Paxson, both of Houston, and Sunny C. Tang, Katy, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 55,225, Jul. 5, 1979, abandoned, which is a division of Ser. No. 905,813, May 15, 1978, Pat. No. 4,179,402. This application Aug. 13, 1979, Ser. No. 66,350
The portion of the term of this patent subsequent to Dec. 15, 1998, has been disclaimed.
Int. Cl.³ C07C *45/50, 27/22*
U.S. Cl. 568—454 **10 Claims**

1. A process for hydroformylating olefins to the corresponding alcohols and/or aldehydes which comprises reacting said olefin with carbon monoxide and hydrogen at hydroformylation conditions including a temperature in the range of from about 40° to about 160° C. and a pressure in the range of from about 1 to about 500 atmospheres, in the presence of a catalyst comprising:

(a) an ion exchange resin having a strongly acidic, weakly acidic, or mixed acid-base type functional group,

(b) a metal selected from the group consisting of cobalt, ruthenium, palladium, platinum and rhodium and which is directly bonded either coordinately or ionically to the ion exchange resin, and

(c) an organic linking compound of from 1 to about 100 carbon atoms which has at least one moiety which contains a heteroatom selected from the group consisting of trivalent nitrogen, trivalent phosphorus, trivalent arsenic, trivalent bismuth and trivalent antimony which is coordinately bonded to the metal and further has at least one moiety which is selected from the group consisting of monohydrocarbyl ammonium, dihydrocarbyl ammonium, trihydrocarbyl ammonium, quaternary ammonium, pyridinium, phosphonium, arsonium and sulfonium and which is ionically bonded to the ion exchange resin.

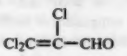
4,317,937

PREPARATION AND USE OF BIS-(1-BROMO-2,3,3-TRICHLORO-2-PROPENYL) ETHER

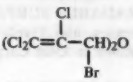
Junichi Saito, and Toyohiko Kume, both of Tokyo, Japan, assignors to Nihon Tokushu Noyaku Seizo K.K., Tokyo, Japan

Filed Jan. 7, 1980, Ser. No. 110,051
Claims priority, application Japan, Jan. 24, 1979, 54-6015
Int. Cl.³ C07C *47/24*
U.S. Cl. 568—488 **2 Claims**

1. In the production of trichloroacrolein of the formula



by reaction of a 2,3,3-trichloropropylene derivative, the improvement which comprises employing bis-(1-bromo-2,3,3-trichloro-2-propenyl) ether of the formula



as such derivative, the reaction comprising steam distillation.

4,317,938

PREPARATION OF SECONDARY ALKANOL ALKOXYLATES

Eugene F. Lutz, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 31, 1980, Ser. No. 221,955
Int. Cl.³ C07C *41/01*
U.S. Cl. 568—619 **6 Claims**

1. A process for preparing a detergent-range secondary alkanol alkoxylate product which comprises:

(a) sulfating, in a sulfation reaction zone, an olefin reactant comprising one or more C_8 to C_{20} olefins by reacting said olefin reactant with sulfuric acid of a concentration between about 75 and 100 percent by weight, thereby obtaining a sulfation reaction product mixture containing one or more C_8 to C_{20} monoalkyl sulfuric acids,

(b) introducing said C_8 to C_{20} monoalkyl sulfuric acids and a glycol reactant, containing one or more compounds selected from the class consisting of C_2 and C_3 alkylene glycols and the polyether glycol condensation products of said alkylene glycols, into an alkoxylation reaction zone and reacting at a temperature between about 100° C. and 160° C. for a time between about 0.1 to 4 hours to obtain the desired detergent-range secondary alkanol alkoxylate.

4,317,939

CATALYZED DISSOLUTION-HYDROLYSIS OF POLYURETHANE WASTES

John L. Gerlock, Dearborn; Jacob Braslaw, Southfield; both of Mich., and Jane Albright, Bremerton, Wash., assignors to Ford Motor Company, Dearborn, Mich.

Filed Feb. 23, 1981, Ser. No. 237,008
Int. Cl.³ C07C *41/01*
U.S. Cl. 568—121 **23 Claims**

1. A process for recovery from polyether polyurethane foam of substantially pure polyether polyol which can be used to make new foam, comprising the steps of:

(a) forming a solution by dissolving said polyether polyurethane foam in a saturated alcohol having a boiling point of between about 225° C. and about 280° C. at a temperature

between about 185° C. and about 220° C. under a non-oxidizing atmosphere;

(b) adding water and alkali metal hydroxide catalyst to said solution under a non-oxidizing atmosphere, said water being added in an amount sufficient to create a mixture which has a boiling point within the temperature range of from about 175° C. to about 220° C., and said alkali metal hydroxide catalyst being added in an amount of at least about 0.1 weight percent based on the weight of said polyurethane foam;

(c) refluxing said solution under said non-oxidizing atmosphere to substantially hydrolyze dissolution products subject to hydrolysis into amines and alcohol while (1) periodically adding a sufficient amount of water to maintain a mixture having a boiling point within said range of from about 175° C. to about 220° C. and (2) maintaining said solution at a temperature within said range; and

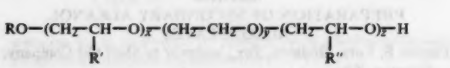
(d) subjecting at least a portion of said solution to vacuum purification at a temperature below about 230° C. so as to allow recovery therefrom of substantially pure polyether polyol.

4,317,940
BIODEGRADABLE SURFACTANTS

Michael Scardera, Hamden, and Frank R. Grosser, Bethany, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Dec. 23, 1980, Ser. No. 219,555
Int. Cl.³ C07C *43/11*
U.S. Cl. 568—625 **6 Claims**

1. A compound having the formula:



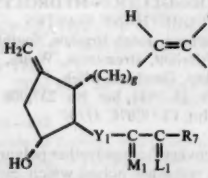
wherein R is a linear, alkyl hydrocarbon having an average of from about 6 to about 10 carbon atoms; R′ is a linear, alkyl hydrocarbon of 1 to about 4 carbon atoms; R″ is a linear, alkyl hydrocarbon of from 1 to about 4 carbon atoms; x is an integer from about 8 to about 12; y is an integer from about 19 to about 25; and z is an integer from about 2 to 7.

4,317,941
2-DECARBOXY-2-HYDROXYMETHYL-TRANS-2,3-DIDEHYDRO-9-DEOXY-9-METHYLENE-PGF COMPOUNDS

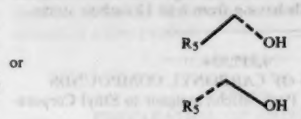
Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 893,771, Apr. 5, 1978, Pat. No. 4,165,436. This application Aug. 11, 1978, Ser. No. 932,997
The portion of the term of this patent subsequent to Jul. 25, 1995, has been disclaimed.
Int. Cl.³ C07C *43/215, 35/06*
U.S. Cl. 568—646 **22 Claims**

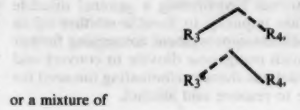
1. A prostaglandin analog of the formula



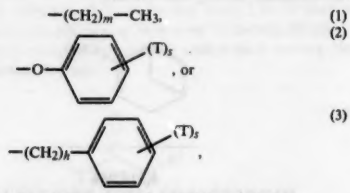
wherein Y_1 is trans-CH=CH-, -C≡C-, $-CH_2CH_2-$, or cis-CH=CH-;
wherein M_1 is



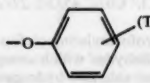
wherein R_5 is hydrogen or methyl;
wherein L_1 is



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;
wherein g is 4, 5, or 6;
wherein R_7 is



wherein h is zero, one, two, or three,
wherein m is one to 5, inclusive, T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, and s is zero, one, 2, or 3, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl, with the further proviso that R_7 is



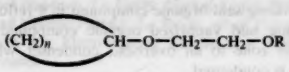
wherein T and s are as defined above, only when R_3 and R_4 are hydrogen or methyl, being the same or different.

4,317,942
ODORIFEROUS 2-ALKOXYETHYL-CYCLOALKYL-ETHERS

Klaus Burzin, Marl, Fed. Rep. of Germany, assignor to Chemische Werke Huels, Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Jul. 11, 1980, Ser. No. 167,601
Claims priority, application Fed. Rep. of Germany, Jul. 13, 1979, 2928348
Int. Cl.³ C07C *43/184, 43/188*
U.S. Cl. 568—670 **5 Claims**

1. A 2-alkoxyethyl-cycloalkyl-ether of the formula



wherein

R is a saturated or unsaturated aliphatic hydrocarbon residue of 1–3 carbon atoms and

n is an integer of 5 to 11.

4,317,943

PROCESS FOR PREPARING GLYCOL ETHERS

John F. Knifton, Austin, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Sep. 12, 1980, Ser. No. 186,933

Int. Cl.³ C07C *41/01*

U.S. Cl. 568—678 **22 Claims**

1. A process for preparing glycol monoalkylethers and dialkylethers which comprises reacting a mixture of hydrogen, carbon monoxide, an aldehyde of the formula:

RCHO,

wherein R is selected from the group consisting of hydrogen and alkyl of from 1 to 10 carbon atoms and an alcohol of the formula:

R'OH,

wherein R' is alkyl of from 1 to 10 carbon atoms, in the presence of a catalyst comprising a cobalt-containing compound and at least one cyclopentadienyl ligand at superatmospheric pressures of 500 psi or greater until substantial formation of the said glycol monoalkylethers and dialkylethers has been achieved and recovering the said ethers from the reaction mixture.

4,317,944

PREPARATION OF 2,2-BIS(4-HYDROXYPHENYL) PROPANE

Gary C. Davis, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 15, 1980, Ser. No. 178,515

Int. Cl.³ C07C *39/16*

U.S. Cl. 568—728 **11 Claims**

1. The process for accelerating the rate of formation of 2-bis(4-hydroxyphenyl) propane, which comprises heating a mixture of phenol and acetone in the presence of an acidic condensation catalyst and in the further presence of an effective amount of an aliphatic alcohol selected from the class consisting of methanol, ethanol, propanol, ethylene glycol, 1,3-propanediol, 1,4-butanediol, 1,2-propanediol, 1,2-butanediol, pentaerythritol, glycerol, and trimethylolpropane, and thereafter isolating the aforesaid hydroxyphenyl propane.

4,317,945

PROCESS FOR PREPARING 2-METHYL-2-SEC.BUTYL-1,3-PROPANEDIOL

Wolfgang Bernhagen, Mulheim an der Ruhr; Jürgen Weber, Oberhausen; Helmut Bahrmann, Hünxe, and Helmut Springer, Oberhausen, all of Fed. Rep. of Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Filed Aug. 15, 1980, Ser. No. 178,396

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1979, 2933919

Int. Cl.³ C07C *29/14, 31/20*

U.S. Cl. 568—853 **18 Claims**

1. A process for the preparation of 2-methyl-2-sec. butyl-1,3-propanediol comprising

hydroformylating 2-methyl-1-butene with carbon monoxide and hydrogen in the presence of a first catalyst to form the substance 3-methyl-pentanal,

separating said methyl pentanal from said first catalyst by flash distillation,

condensing said substance with formaldehyde, or a compound which forms formaldehyde under the conditions of condensation in a basic medium to form alpha-sec. butyl-acrolein,

separating said acrolein from said basic medium by flash distillation,

partially hydrogenating said acrolein in the presence of a second catalyst to form the material 2,3-dimethylpentanal, and

converting said material into said diol by treatment with formaldehyde, or a compound which forms formaldehyde under the conditions of conversion, in the presence of a strong base as a third catalyst.

4,317,946

PROCESS FOR PRODUCING ETHYLENE GLYCOL VIA CATALYTIC HYDROGENATION OF GLYCOLALDEHYDE

Lawrence C. Costa, Nanuet, N.Y., assignor to The Halcon SD Group, Inc., New York, N.Y.

Filed Jun. 27, 1980, Ser. No. 163,550

Int. Cl.³ C07C *31/20*

U.S. Cl. 568—862 **12 Claims**

1. A process for the hydrogenation of glycolaldehyde to form ethylene glycol which comprises contacting glycolaldehyde with hydrogen in the presence of a liquid medium containing an organic solvent for the glycolaldehyde which may optionally contain water in which medium there is also dissolved a catalytic amount of at least one ruthenium carboxylate catalyst of the formula:

wherein n is 2 or 3, A^1 is hydrogen or a carboxylate moiety derived from an aliphatic saturated monocarboxylic acid of from 1 to 20 carbon atoms or from an aromatic monocarboxylic acid having from 7 to 14 carbon atoms, and substituted derivatives thereof, wherein the substituents comprise members selected from the group consisting of halo, alkyl of 1 to 10 carbon atoms, alkoxy of 1 to 8 carbon atoms, acyl of 1 to 10 carbon atoms, cyano, tertiary amido of from 2 to 14 carbon atoms, carboxyalkyl of from 2 to 10 carbon atoms, hydroxy and cycloalkyl of from 3 to 8 carbon atoms, A^2 is a carboxylate moiety derived from an aliphatic saturated monocarboxylic acid of from 1 to 20 carbon atoms or from an aromatic monocarboxylic acid having from 7 to 14 carbon atoms, and substituted derivatives thereof, wherein the substituents comprise members selected from the group consisting of halo, alkyl of 1 to 10 carbon atoms, alkoxy of 1 to 8 carbon atoms, acyl of 1 to 10 carbon atoms, cyano, tertiary amido of from 2 to 14 carbon atoms, carboxyalkyl of from 2 to 10 carbon atoms, hydroxy

and cycloalkyl of from 3 to 8 carbon atoms, and R is phenyl or a mono- or poly-nuclear substituted or unsubstituted aryl of 7 to 14 carbon atoms wherein the substituents, if present, are halo, alkyl of 1 to 10 carbon atoms alkoxy of 1 to 8 carbon atoms, acyl of 1 to 10 carbon atoms, cyano, tertiary amido of from 2 to 14 carbon atoms, carboxyalkyl of from 2 to 10 carbon atoms, hydroxy and cycloalkyl of from 3 to 8 carbon atoms, with the proviso that n=3 when A^1 is hydrogen, to form said ethylene glycol.

4,317,947

PROCESS FOR THE PREPARATION OF NITROSOBENZENE

Hans Zengel, Nordring, and Manfred Bergfeld, Erlenbach, both of Fed. Rep. of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Filed Sep. 24, 1980, Ser. No. 190,291

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1979, 2939692

Int. Cl.³ C07C *76/00, 81/02*

U.S. Cl. 568—949 **3 Claims**

1. A process for the preparation of nitrosobenzene from nitrobenzene in the presence of catalysts at temperatures from about 250° to about 450° C., characterized by the fact that the reaction time is from about 0.5 to about 40 seconds, excess heat of reaction is removed and the reaction is carried out in the absence of reducing agents and at pressures in the range from about 0.01 to about 40 bar.

4,317,948

PRODUCTION OF BRANCHED HYDROCARBONS

Louis F. Heckelsberg, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 21, 1980, Ser. No. 132,556

Int. Cl.³ C07C *2/08*

U.S. Cl. 585—329 **7 Claims**

1. A process for producing branched hydrocarbons having at least 22 carbon atoms per molecule comprising

(a) contacting a mixed olefin feedstock comprising a first and a second olefin component both constituting a substantial portion of the total olefin feedstock

said first olefin component of one or more 1-olefins having the formula

$$R''—CH=CH_2 \quad (1)$$

and said second olefin component of one or more internal olefins having the formula

$$R—CH=CH—R' \quad (2)$$

wherein R, R' and R'' which can be the same or different are alkyl radicals of 6 to 16 carbon atoms, with a nickel containing dimerization catalyst under dimerization conditions to form a mixture containing said branched hydrocarbon comprising olefins codimerized of said 1-olefin with said internal olefin, and

(b) separating said branched hydrocarbon from said mixture.

4,317,949

ALKYLATION PROCESS AND APPARATUS USEFUL THEREIN

Ronald J. Vaughan, Claremont, Calif., assignor to Varen Technology, Marshallton, Del.

Filed Feb. 23, 1976, Ser. No. 660,634

Int. Cl.³ C07C *2/66, 2/70*

U.S. Cl. 585—458 **3 Claims**

1. A process for the alkylation of an organic compound, said organic compound being selected from the group consisting of mono and polynuclear aromatics, paraffins, organic acids and alcohols, which comprises the steps of

(1) vaporizing said organic compound in a reflux zone

(2) passing said vaporized organic compound through a catalyst zone to an overhead condenser whereby said vapor is condensed.

(3) returning said condensed organic compound to said catalyst zone and in said catalyst zone contacting said condensed organic compound with said vaporized organic compound and an olefin in the presence of a solid acid catalyst at alkylating conditions whereby a monoalkylate derivative of said organic compound is formed,

(4) returning said mono-alkylate derivative and unreacted organic compound to said reflux zone, and

(5) recovering said mono-alkylate derivative from said reflux zone.

4,317,950

USE OF AMINE-ALUMINUM CHLORIDE ADDUCTS AS ALKYLATION INHIBITORS IN A LIGAND-COMPLEXING PROCESS

Donald J. Haase, Houston; David G. Walker, Baytown, and Paul C. Ostrowski, Webster, all of Tex., assignors to Tenneco Chemicals, Inc., Piscataway, N.J.

Filed Jul. 23, 1980, Ser. No. 171,630

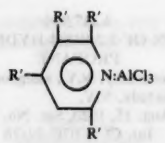
Int. Cl.³ C07C *11/02*

U.S. Cl. 585—852 **13 Claims**

1. In the process for the separation of complexible ligands from a gas feedstream that comprises ethylene, propylene, or mixtures thereof wherein (a) said gas feedstream is contacted with a liquid sorbent that is a solution in an aromatic hydrocarbon or halogenated aromatic hydrocarbon of a bimetallic salt complex having the formula $M_IM_{II}X_n$.Aromatic, wherein M_I is a Group I-B metal, M_{II} is a Group III-A metal, X is halogen, n is the sum of the valences of M_I and M_{II}, and Aromatic is a monocyclic aromatic hydrocarbon or halogenated aromatic hydrocarbon having 6 to 12 carbon atoms, thereby forming a reaction mixture that comprises a solution of a complex of the complexible ligand and the bimetallic salt complex in the liquid sorbent, (b) the reaction mixture is separated from the gas feedstream, (c) the ligand is separated from the liquid sorbent in the reaction mixture, and (d) the liquid sorbent is recycled to Step (a), the improvement that comprises incorporating in said liquid sorbent from 8.5 mole percent to 30 mole percent, based on the Group I-B metal in the bimetallic salt complex component of the liquid sorbent, of an amine-aluminum chloride adduct selected from the group consisting of

(a) adducts having the formula $R_3N{:}AlCl_3$, wherein each R represents hydrogen, alkyl having 1 to 3 carbon atoms, phenyl, or methylphenyl;

(b) adducts having the formula



wherein each R' represents hydrogen or alkyl having 1 to 4 carbon atoms; and

(c) mixtures thereof,

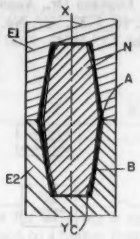
thereby substantially reducing alkylation and other side reactions during the ligand-separation process and stabilizing the liquid sorbent.

4,317,951

NIPPLED JOINT FOR FURNACE ELECTRODE

Jean-Michel Boudeau, Le Fayet; Michel Logue, Sainte-Foy-les-Lyon, and Claude Parisot, Le Fayet, all of France, assignors to Societe des Electrodes et Refractaires Savoie (SERS), Paris, France

Filed Oct. 20, 1980, Ser. No. 198,618
Claims priority, application France, Nov. 9, 1979, 79 28144
Int. Cl.³ H05B 7/14
U.S. Cl. 13—18 C 7 Claims



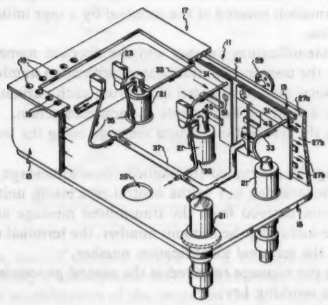
1. A nippled joint for a furnace electrode, said electrode having two opposed sections with internally threaded seats, a nipple having threads on each end thereof and adapted to be received in said seats, and wherein the clearance between the threads of the nipple and the threads of the seats of the two electrode sections passes through a minimum value at a level situated in the running part of the threads between approximately a tenth and a quarter of the height of the engaged threads as measured in each seat from the base thereof.

4,317,952

LIQUID COOLED TERMINAL BOXES

Anthony F. Armor; James B. Archibald, both of Schenectady, and David A. Noel, Rotterdam Junction, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 5, 1978, Ser. No. 948,816
Int. Cl.³ H05K 7/20
U.S. Cl. 174—15 BH 15 Claims



1. A terminal box for a multi-phase dynamoelectric machine having high voltage bushings passing there through, said terminal box comprising:

a base plate supporting said terminal bushings;

a first terminal box wall defining an enclosure about the high voltage bushings;

a second terminal box wall spaced from but adjacent to said first terminal box wall; said first and second walls defining at least one sealed flow channel about the terminal box;

a box inlet opening and a box outlet opening connected to said box whereby liquid coolant may be circulated through the walls of the box;

at least one channel outlet fluidly connecting the channel with the terminal bushings;

at least one channel inlet fluidly connecting the terminal bushings with the channel whereby liquid coolant may be withdrawn from the channel into the terminal bushings and returned from the terminal bushings into the channel; and,

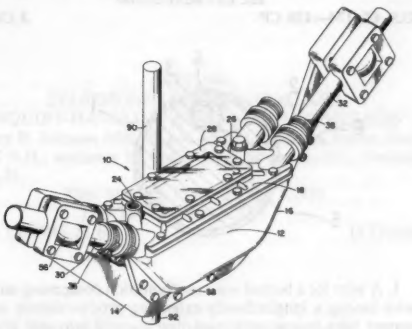
a plurality of horizontal furring strips dividing said channel into at least one upper channel and at least one lower channel extending around the perimeter of the terminal box.

4,317,953

STRAIN RELIEF FOR CABLE SPLICE CLOSURES

Kenneth W. Brownell; Virgil Bolick, both of Asheville; Joseph Carswell, Leicester, and Robert C. Hazenfield, Asheville, all of N.C., assignors to Akzona Incorporated, Asheville, N.C.

Filed Apr. 14, 1980, Ser. No. 140,513
Int. Cl.³ H02G 15/10
U.S. Cl. 174—21 R 10 Claims



1. A splice assembly comprising:

a splice closure including a top surface; a pair of openings in said splice closure for receiving a pair of cables, each cable having a jacket and having at least one conductor adapted to be spliced within the closure; a pair of cable clamping means, each firmly attached to the jacket of each cable at some distance removed from said splice closure; a pair of arms rigidly securing said cable clamping means to each other, said arms projecting away from said top surface of said splice closure at an angle greater than 0° from said surface, whereby strain relief is imparted to the splice assembly.

4,317,954

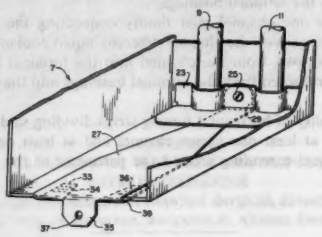
ELECTRICAL BOXES AND ACCESSORY THEREFORE

John R. Giammarra, 712 Frann Rd., Toms River, N.J. 08753

Filed Oct. 25, 1979, Ser. No. 88,145
Int. Cl.³ H02G 3/08
U.S. Cl. 174—53 6 Claims

1. A new- construction metal electrical box of the type originally having electrical device mounting ears, said box including cable clamps at the rear thereof secured to said box by cable clamp screws, one of said mounting ears having been knocked off said box, said box including a replacement for said

mounting ear comprising a metal bracket clipped onto the wall of said box on each side of the former location of said knocked-



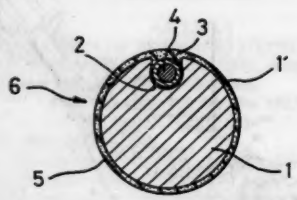
off ear, and secured to the rear of said box by one of the cable clamp screws thereof.

4,317,955

BARBED WIRE

Oh Y. Choi, 224-408 Jhamsil 2-dong, Kangnam-ku, Seoul, Rep. of Korea

Filed Oct. 23, 1979, Ser. No. 87,562
Int. Cl.³ B21F *25/00*
U.S. Cl. 174—126 CP **3 Claims**



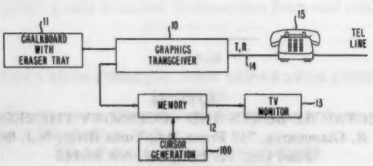
1. A wire for a barbed wire configuration comprising an iron wire having a longitudinally extending groove therein and a copper wire coated with insulation inserted into said groove and extending along said groove, said iron wire and copper wire being coated.

4,317,956

REMOTE CHALKBOARD AUTOMATIC CURSOR

Gabor P. Torok, Holmdel, and Andrew B. White, Marlboro, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 10, 1980, Ser. No. 205,634
Int. Cl.³ G08C *21/00*; G08B *23/00*
U.S. Cl. 178—18 **21 Claims**



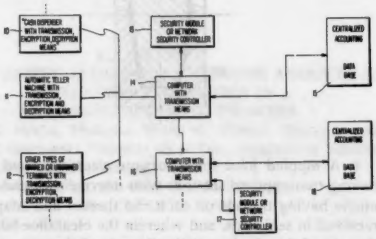
1. A display system having
a sending unit and
a viewing unit for displaying images created at said sending unit,
Characterized by
means for displaying a selective distinctive graphic image at positions on said viewing unit corresponding to positions where said images are being changed on said sending unit.

4,317,957

SYSTEM FOR AUTHENTICATING USERS AND DEVICES IN ON-LINE TRANSACTION NETWORKS

Marvin Sendrow, 4609 Logsdon Dr., Annandale, Va. 22003

Filed Mar. 10, 1980, Ser. No. 129,110
Int. Cl.³ H04L *9/00*
U.S. Cl. 178—22.08 **17 Claims**



1. In a system for authenticating users and devices in on-line transaction networks comprising a plurality of remote terminals in communication with a central processing unit including a data base containing encrypted data used in the authentication of the users and devices, said data being encrypted with a master key and including terminal master keys for each of said remote terminals and identification numbers for each of said users all of which are secret, said data further including terminal identification numbers for each of said remote terminals and account numbers for each of said users, wherein each of said remote terminals is provided with means for entering an account number and an identification number of a user initiating a transaction as well as the nature of the transaction, the improvement in a method for protecting the transaction comprising the steps of:

generating at a terminal a transaction request message based on the information entered at the terminal by a user initiating a transaction,

using the identification number and the account number entered by the user and the terminal identification number and the terminal master key, and employing such variants as to generate a working key unique to each transaction,

encrypting the transaction request message using the working key,

transmitting the encrypted transaction request message,

deriving the working key at the central processing unit using information derived from the transmitted message and the data base including the account number, the terminal master key and the terminal identification number,

decrypting the message received at the central processing unit using the working key,

comparing the user identification number and account number obtained by decrypting corresponding data in the data base with the data in the transaction request message to validate the transaction request message,

generating a transaction request response and encrypting the transaction request response with the working key,

transmitting the encrypted transaction request response to the terminal where the transaction was initiated, and

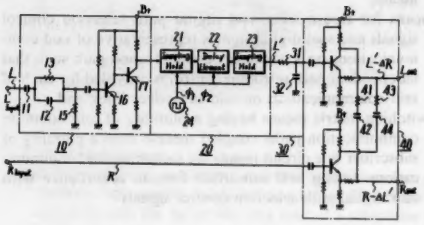
decrypting the message received at the terminal using the working key and, if the transaction is approved, providing the requested service.

4,317,958

NOISE REDUCING CIRCUIT FOR CTD DELAY LINE

Kenji Hamaguchi, and Mitsuru Hosoya, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 3, 1980, Ser. No. 109,339
Claims priority, application Japan, Jan. 17, 1979, 54/4296
Int. Cl.³ H04S 1/00
U.S. Cl. 179—1 G 4 Claims



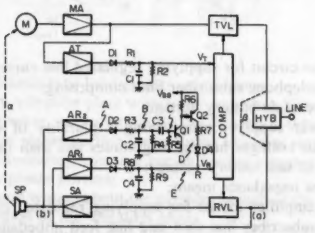
1. A delay circuit for delaying a signal extending from a lower frequency region to a higher frequency region, comprising: a charge transfer device having an input, a series of stages and an output and being operative to transfer a signal from said input to said output in response to a clock signal applied to said stages; clocking means for supplying said clock signal to said charge transfer device; preemphasis means for emphasizing said signal in said higher frequency region before application thereof to said input; and deemphasis means for emphasizing said signal in said lower frequency region at said output of said charge transfer device to compensate for the emphasis of said preemphasis means so that the delay circuit has a total response that is substantially flat.

4,317,959

SPEECH CONTROL CIRCUIT

Shigeya Kuriki, Tokyo, Japan, assignor to OKI Electric Industry Co., Ltd., Tokyo, Japan

Filed Mar. 12, 1980, Ser. No. 129,714
Claims priority, application Japan, Mar. 26, 1979, 54-34283
Int. Cl.³ H04M 1/60
U.S. Cl. 179—1 VC 1 Claim



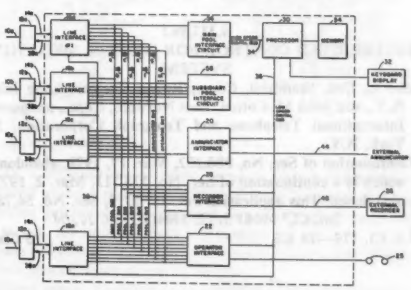
1. A speech control circuit for a loudspeaker telephone comprising a microphone (M), a microphone amplifier (MA) for the amplification of the output of the microphone, a transmission control amplifier (AT) connected to the output of the microphone amplifier, a transmit variolosser (TVL) connected to the output of the microphone amplifier for providing variable attenuation, a receive variolosser (RVL), a hybrid circuit (HYB) connected to the output of the transmit variolosser, the input of the receive variolosser, and a transmission line, a speaker amplifier (SA) connected to the output of the receive variolosser, a speaker (SP) connected to the output of the speaker amplifier for converting an electric signal to an acoustic signal, a first reception control amplifier (AR_1) connected to the input of the receive variolosser, a second reception control amplifier (AR_2) connected to the output of the speaker amplifier, a comparator (COMP) for comparing an output V_t of the transmission control amplifier and a received signal level V_r which is the sum of the outputs of the first and the second reception control amplifiers, said comparator controlling the variolossers so that when $V_t \geqq V_r$ is satisfied, the attenuation in the transmit variolosser is small and the attenuation in the reception variolosser is large, and when $V_t < V_r$ is satisfied or the values V_t and V_r are lower than the predetermined value, the attenuation in the transmit variolosser is large, and the attenuation in the reception variolosser is small, characterized in that a first rectification and integration circuit is provided at the output of the first reception control amplifier, a second rectification and integration circuit is provided at the output of the second reception control amplifier, a third rectification and integration circuit is provided at the output of the transmission control amplifier for providing the transmission level V_t to the comparator, a differentiation circuit is provided at the output of said second rectification and integration circuit, and means for providing the sum of the output of the differentiation circuit and the output of the first rectification and integration circuit is provided for providing the received signal level V_r to the comparator.

4,317,960

TELEPHONE-CONFERENCING AND INQUIRY-HANDLING APPARATUS AND METHOD

Avery R. Johnson, Milford, and John M. Harrison, Epsom, both of N.H., assignors to Small World Exchange, Inc., Nashua, N.H.

Filed Mar. 23, 1979, Ser. No. 23,451
Int. Cl.³ H04M 3/56
U.S. Cl. 179—18 BC 15 Claims



1. Caller-initiated telephone conferencing apparatus comprising

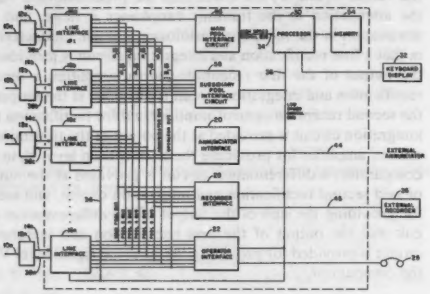
caller-responsive input means for concurrently receiving a plurality of incoming telephone line calls over an associated plurality of incoming telephone lines and including means for responding to a signaling indication on any incoming telephone line for conditioning that line for communication, and

switching means responsive to said input means for selectively connecting conditioned incoming lines to any of plural conference groupings wherein any incoming line in a grouping can communicate with all other incoming lines connected to said grouping and each conference grouping has the capacity of at least three incoming calls.

4,317,961
TELEPHONE-CONFERENCING APPARATUS AND METHOD

Avery R. Johnson, Milford, N.H., assignor to Small World Exchange, Inc., Nashua, N.H.

Filed Mar. 23, 1979, Ser. No. 23,452
Int. Cl.³ H04M *3/56*
U.S. Cl. 179—18 BC **10 Claims**



1. Caller-initiated telephone conferencing apparatus comprising

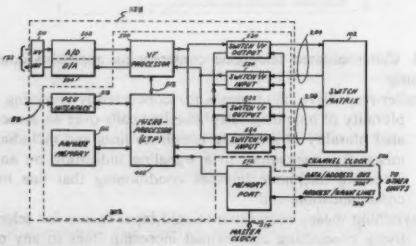
caller-responsive input means for concurrently receiving a plurality of incoming telephone line calls over an associated plurality of incoming telephone lines and including means for responding to a signaling indication on any incoming telephone line for conditioning the line for communication, and

switching means responsive to said input means for automatically connecting the conditioned lines associated with said incoming calls to a conference grouping wherein any of said associated incoming lines in the grouping provides communication with all other lines connected to said grouping and said grouping has the capacity of at least three incoming calls.

4,317,962
DISTRIBUTED CONTROL FOR DIGITAL SWITCHING SYSTEM

John E. Cox, Stamford, Conn.; Robert Treiber, Long Island, N.Y., and John M. Cotton, East Norwalk, Conn., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Continuation of Ser. No. 888,252, Mar. 17, 1978, abandoned, which is a continuation of Ser. No. 773,712, Mar. 2, 1977, abandoned. This application Jul. 12, 1979, Ser. No. 56,752
Int. Cl.³ H04J *3/12*; H04Q *3/54, 11/04*
U.S. Cl. 179—18 ES **13 Claims**



7. In a continuously expandable switching system for providing a plurality of communications among a plurality of subscriber lines and including a distributed call control processor dedicated to each line for the duration of each subscriber call:

subscriber line circuit means having at least one of said subscriber lines terminated thereat, for deriving digital path selection control signals and for deriving digital signals representative of that portion of said plurality of communications which is associated with the subscriber line or lines terminated at said subscriber line circuit means;

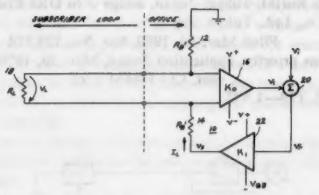
means for transmitting said digital path selection control signals and said digital signals representative of said communications on a common communication path such that independent path selection control is provided for each of said communications on said subscriber lines; and

switching matrix means having a plurality of said common communication paths coupled thereto from a plurality of subscriber line circuit means for switching said communications among said subscriber lines in accordance with said digital path selection control signals.

4,317,963
SUBSCRIBER LINE INTERFACE CIRCUIT UTILIZING IMPEDANCE SYNTHESIZER AND SHARED VOLTAGE SOURCE FOR LOOP CURRENT REGULATION CONTROL

Ramon C. W. Chea, Jr., Monroe, Conn., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Sep. 22, 1980, Ser. No. 189,976
Int. Cl.³ H04M *19/00*
U.S. Cl. 179—77 **17 Claims**



1. A line circuit for supplying regulated line current to one or more telephone subscriber lines comprising:

a source of dc battery voltage;

dc power supply means having a plurality of selectable output voltages having magnitudes less than the magnitude of said battery voltage;

line feed impedance means;

driver amplifier means for supplying regulated current to said subscriber line thru said line feed impedance means and having a bias voltage input coupled thereto;

sensing means for sensing the output voltage of said driver amplifier means;

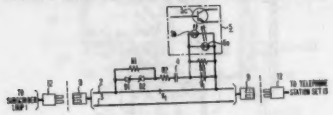
switching means for selecting either said battery voltage or one of said selectable output voltages in response to a control input thereto and for coupling said selected voltage to said bias voltage input of said driver amplifier;

comparator means for deriving said control input to said switching means in response to the comparison of the output of said sensing means to a reference voltage such that the overhead bias power dissipation of said amplifier is minimized by minimizing the differential between the bias voltage applied to said amplifier and the selected voltage.

4,317,964
OFF-HOOK/ON-HOOK STATUS CHECK CIRCUIT

Ronald D. Biggs, Zionsville, and Peter O. Schuh, Noblesville, both of Ind., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 30, 1980, Ser. No. 165,552
Int. Cl.³ H04M 1/00
U.S. Cl. 179—81 R 11 Claims

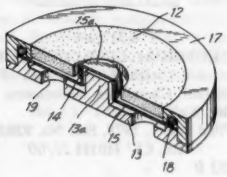


8. In combination:
means for opening and closing a circuit path, the circuit path opening and closing means being adapted for connection in series with the tip or the ring lead of a telephone subscriber line; and
a circuit for determining the switchhook status of a telephone station set associated with the telephone subscriber line, the circuit being responsive to and connected in parallel with the circuit path opening and closing means.

4,317,965
THIN MINIATURIZED DYNAMIC-TYPE LOUDSPEAKER

Mitsuru Toyoda, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Apr. 3, 1980, Ser. No. 137,142
Claims priority, application Japan, Apr. 10, 1979, 54/43317; Apr. 10, 1979, 54/47118[U]
Int. Cl.³ H04R 9/06
U.S. Cl. 179—115.5 R 9 Claims

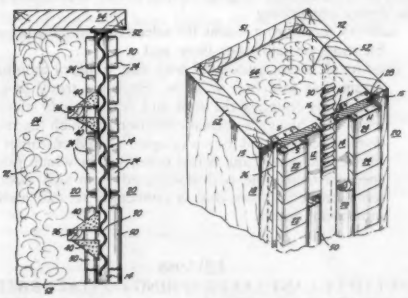


1. A dynamic-type loudspeaker comprising;
a unitary vibration plate within the magnetic circuit of the loudspeaker, said vibration plate having a substantially circular planar portion formed with a central perpendicular cylindrical projecting region having a region parallel to the planar portion;
a voice coil wound about the cylindrical wall of the projecting region of the vibration plate;
a substantially planar yoke having a perpendicular cylindrical central pole dimensioned to cooperate with the projecting region of said vibration plate, said yoke formed with seating means for receiving the vibration plate at the periphery thereof and maintaining the vibration plate spaced apart from said yoke, said vibration plate disposed on said seating means; and
a frame member dimensioned to cooperate with said seating means and including a disc-shaped permanent magnet having a central opening mounted in said frame, said frame member positioned on said seating means about said voice coil and projecting region and overlying and spaced apart from said vibration plate, said frame member supporting the disc-shaped permanent magnet at the circumference thereof and waterproof packing means disposed in the frame member compressed between the frame member and the circumference of said vibration plate.
8. A dynamic-type loudspeaker comprising:
a circular substantially planar yoke having a center pole, an outwardly extending peripheral flange and a peripheral flange extending perpendicular to the planar region adjacent said peripheral flange for forming a seat;
a unitary substantially planar vibration plate within the magnetic circuitry of the loudspeaker, said vibration plate formed with a central, cylindrical projecting region having a region parallel to the planar region of the plate dimensioned to cooperate with the center pole of the yoke, the vibration plate disposed on the upwardly extending peripheral flange;
a voice coil mounted on the projecting region of the vibration plate;
a circular frame member including a substantially circular, planar permanent magnet having a central opening mounted at the circumference thereof to the frame, said magnet dimensioned to fit about the voice coil, and said frame formed with an internal axial U-shaped groove and a resilient packing member disposed in the groove, the frame member dimensioned to engage the seat with the packing member biased against said vibration plate.

4,317,966
VIBRATORY RIBBON SPEAKER

Clive R. B. Lister, P.O. Box 5101 (University Station), Seattle, Wash. 98105

Filed Feb. 19, 1980, Ser. No. 122,696
Int. Cl.³ H04R 9/02
U.S. Cl. 179—115 V 15 Claims



1. In a ribbon-type acoustic speaker system wherein an elongated sound-reproducing ribbon extends lengthwise along a working gap between an opposed pair of elongated magnetic pole pieces, the improvement comprising:
means providing a plurality of supports adjacent said ribbon and spaced apart along its length;
resilient means fixed between said ribbon and said supports; and
said resilient means being shaped to provide lengthwise gradation of resilience from relatively greater firmness medially to less firm ends.
9. A ribbon-type acoustic speaker system, comprising:
an elongated pair of flux concentrating magnetic structures in edge-opposed, spaced-apart relation providing a working gap between pole pieces;
a sound-reproducing ribbon extending lengthwise of said working gap between said pole pieces;
support means spanning said working gap adjacent said ribbon; and
resilient means affixed in spaced-apart ribbon-supporting relation between said ribbon and said spanning support means.
10. A ribbon-type acoustic speaker system, comprising:

an elongated pair of magnetically soft bars mounted in edge-opposed, spaced-apart relation and thereby providing a working gap;

a series of permanently magnetic blocks secured along and sandwiching said bars in a location spaced from the edges of said soft bars defining said working gap; and

a resiliently supported ribbon mounted in said working gap.

4,317,967

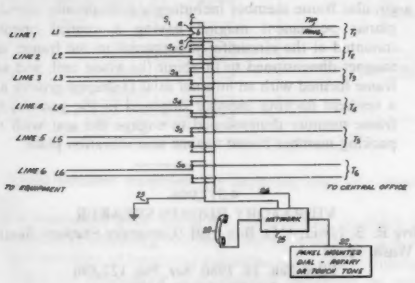
FAULT ISOLATION DEVICE

Paul De Vries; Steven Gewitz, and Roald G. Heyman, all of 71 W. 23rd St., New York, N.Y. 10010

Filed Jul. 17, 1980, Ser. No. 169,715

Int. Cl.³ H04B *3/46*

U.S. Cl. 179—175.3 R **9 Claims**



1. A telephone line fault isolation device to be installed in line between one or more telephone trunk lines and customer telephone equipment coupled to said one or more trunk lines, the device comprising

auditory monitoring means for selectively monitoring audible tones on said trunk lines; and

line switch means associated with said auditory monitoring means and said one or more telephone trunk lines for selectively coupling the same and, for each said telephone trunk line, having a normal condition in which the respective telephone trunk line is coupled to said customer telephone equipment and a test condition in which said respective trunk line is disconnected from said customer telephone equipment and is connected to said auditory monitoring means.

4,317,968

MULTIPLE CANTILEVER SPRING CONTACT SWITCH

Gerd Kuhfus, London, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Jun. 3, 1980, Ser. No. 155,933

Int. Cl.³ H01H *3/12*

U.S. Cl. 200—5 R **11 Claims**

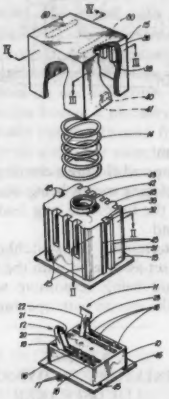
1. A multiple cantilever spring contact switch, comprising:

a base, a housing fitting on said base, and a captive cap fitting over said housing and including means for resiliently biasing said cap upwards on said housing away from said base;

said base including two pairs of rows of sockets, at least two sockets in a row, two rows making a pair, and a cantilever spring contact positioned in each socket to provide a plurality of pairs of contacts, the contacts of a pair having a predetermined biased relationship giving alternatively normally open and normally closed conditions as desired;

said housing being hollow and fitting over said base and said contacts and attached to said base, said housing including slots in side walls thereof, aligned with said contacts, said contacts being biased towards said side walls with at least the outer contact of each pair in contact with the inner surface of a side wall, said housing including means on the inner surfaces of the side walls for biasing an inner contact of a pair away from an outer contact where a normally open condition is required, and including two associated spaced apart slots at any position for a normally closed condition pair of contacts, the spacing of said two associated slots such that an outer contact rests against the side wall between the associated slots and an inner contact overlaps the associated slots;

said cap being hollow and having a top surface and sides, and including cam members on an inner surface of two



opposed sides, said cam members extending through said slots in said housing;

said cams in an upward position of the cap, removed from said contacts and in a downward position each cam member engaging with and biasing one of a pair of contacts to change the condition of the pair;

means retaining said cap on said housing; and

means for connecting electrical conductors to said contacts.

4,317,969

ELECTRICAL LINE-CONNECTOR

Hannes Riegler, and Ulrich Wittwer, both of Chalet Rothusi, 3818 Grindelwald Cheminees Isolationen, Umbauten von Kuchen, Bader, Switzerland

Filed Sep. 1, 1978, Ser. No. 938,962

Int. Cl.³ H01H *21/00*

U.S. Cl. 200—52 R **4 Claims**

1. A safety connector for electrical connections with two mating connector parts that fit together, each of which connector parts contains contacts connected to electrical wiring, comprising:

first and second connector parts each having a planar contact face for joining abutment and relative rotational positioning;

first and second contacts disposed in generally planar disposition on the first contact face of said first connector part, said first contact being central and said second contact being peripheral to the first contact face;

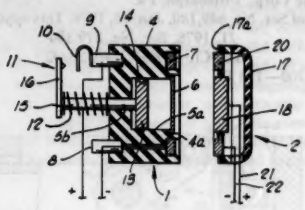
first and second contacts disposed in generally planar disposition on the second contact face of said second connector part, said first contact being central and said second contact being peripheral to said second contact face, said first central contact being constituted of permanent magnet material;

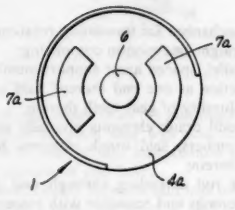
spring loaded contact means disposed in said second connector part to be magnetically attractable to electrically connect to said central first contact of said first connector part when the planar contact faces are placed in juxtaposition;

switch means in said second connector part connected to said electrical wiring in current conductive mode only

when said spring loaded contact means is magnetically attracted; and

means for limiting the relative positioning of said first and second connector parts between a first position wherein





respective first and second contacts of the first and second connector parts are in electrical contact and a second position at least 90° displaced wherein the respective second contacts of said first and second connector parts are not in conductive contact.

4,317,970

ENTRAPMENT PREVENTION DEVICE

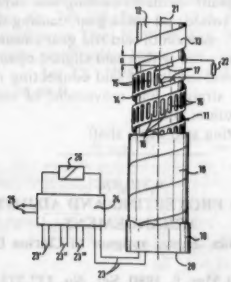
Manfred Häfner, Merzhausen, and Heinz Hunold, Waldkirch, both of Fed. Rep. of Germany, assignors to Erwin Sick GmbH Optik-Elektronik, Waldkirch, Fed. Rep. of Germany

Filed Feb. 27, 1980, Ser. No. 125,211

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1979, 2908471

Int. Cl.³ H01H *3/16*

U.S. Cl. 200—61.43 **26 Claims**



1. An entrapment prevention device for fastening to edge means associated with a closable opening, the device comprising: first and second electrically conductive bands of which at least one is resilient, said bands being held spaced apart and facing each other so as to contact one another on the application of pressure, and a monitoring circuit capable of detecting said contact, the first and second bands being each in the form of an elongate helix-like structure, with one band covering the other substantially over their entire length.

4,317,971

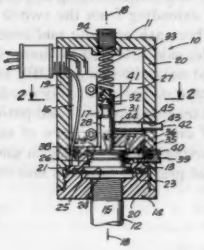
ADJUSTABLE PRESSURE AND VACUUM LIMIT SWITCH VALVE

Verlon C. Roth, Pasadena, Calif., assignor to RK Industries, Ontario, Calif.

Filed May 27, 1980, Ser. No. 153,601

Int. Cl.³ H01H *35/34*

U.S. Cl. 200—83 J **4 Claims**



1. An adjustable pressure and vacuum limit switch valve comprising:

a valve base having a pair of parallel exterior and interior plane base faces, and an aperture disposed through said valve base normal to said pair of plane base faces, said exterior plane face adapted and sized to conductively accept and secure a fluid flow pipe to said exterior plane face,

a flexible elastic composition diaphragm having a first diaphragm face conductively coaxially sealed to said interior face of said valve base, sealing off the conduction of said fluid flow pipe,

a valve top housing having a hollow dome interior, having a threaded top aperture coaxially disposed through the housing face opposed to said valve base, and having securing means conductively sealing said valve base to said valve top housing,

a tubular valve cage sized and secured in said valve top housing, said valve cage having a flat first cage terminus securely disposed on the second diaphragm face and forming a second diaphragm seal, said valve cage having a second cage terminus disposed inside said valve top housing, said valve cage having an integral ledge coaxially formed on said valve cage coterminous with said flat first cage terminus, said integral ledge mating with a valve top housing coaxial ledge disposed adjacent to the securing means sealing said valve base to said valve top housing, said valve cage having a symmetrical coaxial cage aperture therein extending from said first cage terminus to said second cage terminus, said coaxial cage aperture symmetrically disposed along the valve bore axis, said cage aperture having an expanded volume at said second cage terminus and an expanded stepped volume at said first cage terminus,

a valve plug having a mating symmetrical plug step adapted and sized to fit in and mate with said expanded stepped volume disposed at said first cage terminus, the first face of said valve plug sealed against said second face of aforesaid flexible diaphragm, said valve plug slidably moving coaxially in said valve cage in response to varying fluid pressure in said fluid flow pipe, a plug first spindle coaxially normally secured to the second face of said valve plug by the first spindle first terminus, and an annular groove formed around said first spindle adjacent to the second terminus of said first spindle, said first spindle adaptively sized to slide in said valve cage symmetrical coaxial cage aperture,

a first pressurizing spring means secured in said valve top housing along said valve bore axis having one first spring

means terminus bearing on said first spindle second terminus, and a second terminus of said first spring means bearing on an adjustable set screw secured in said valve top housing threaded aperture,

an ON-OFF electrical switch having permanent securing means attaching said switch to a peripheral aperture in said valve cage, said aperture disposed parallel to said valve bore axis and along the exterior perimeter of said valve cage, said switch having a spring loaded push button detent extending from the switch body normally to said valve bore axis and into said annular groove of said first spindle, said ON-OFF switch electrically conductively wired normally ON and OFF as selected,

said push button detent selectively conductively switching as required on engagement of said push button detent into and out of said annular groove of said first spindle on slidably moving said valve plug in said valve cage aperture, as fluid pressure varies on said flexible diaphragm.

4,317,972

RF TRANSFER SWITCH

Evert Kjellberg, Los Angeles, Calif., assignor to Transco Products, Inc., Venice, Calif.

Filed Jun. 9, 1980, Ser. No. 157,397

Int. Cl.³ H01H *1/20*

U.S. Cl. 200—153 S **12 Claims**

1. An RF transfer switch for providing all possible combinations between pairs of connectors in an array of four connectors, including

an RF cavity disposed in a particular plane and formed by a plurality of cavity portions and including an outer circumferential portion and three radial portions each extending from a central intersecting position within the circumferential portion and intersecting the circumferential position at three spaced positions to subdivide the circumferential portion into three outer portions for forming a total of six cavity portions,

four RF connectors coupled to the RF cavity and with three of the connectors each individually coupled to the cavity portions at an intersection between one of the radial portions and the circumferential portion and with the fourth connector coupled to the central intersecting position, and

a plurality of six RF transfer means each located within one of the six cavity portions and with each transfer means individually movable between a first position for preventing transfer of RF energy between a pair of connectors and a second position for coupling RF energy between a pair of connectors and with the transfer means each located within the particular plane.

4,317,973

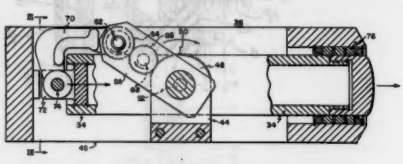
DISCONNECT SWITCH AND DRIVE MECHANISM THEREFOR

John H. Golota, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 649,180, Jan. 15, 1976. This application Feb. 21, 1978, Ser. No. 879,184

Int. Cl.³ H01H *3/40, 33/42*

U.S. Cl. 200—153 P **2 Claims**



1. A drive mechanism for translating rotational motion to a substantially straight line motion comprising:

a pair of parallel, spaced apart support members having an arcuate section at one end thereof, said arcuate section having a plurality of gear teeth therein;

first and second crank elements pivotally coupled to said support members, said crank elements having aligned openings therein;

a connecting rod extending through said crank element aligned openings and rotatable with respect thereto, said connecting rod coupling said crank elements together;

a crank gear rotatably coupled to said first crank element and positioned adjacent to, and cooperating with, said support member gear teeth;

a rod gear fixedly secured to said connecting rod and positioned adjacent to, and cooperating with, said crank gear, said support member gear teeth having a pitch diameter twice the pitch diameter of said rod gear;

a drive arm fixedly secured to said connecting rod and movable therewith and having an end section distal from said connecting rod, the distance from said connecting rod to said distal end section being substantially the same as the distance from said connecting rod to the location of the pivotal coupling of said crank elements to said support members;

a rotatable drive shaft coupled to one of said crank elements, rotation of said drive shaft causing pivotal motion of said crank elements and said connecting rod, the pivotal motion of said crank elements causing said support member gear teeth to rotate said crank gear, causing the rotation of said rod gear, rotation of said rod gear causing rotation of said connecting rod within said aligned opening, the rotation and pivotal motion of said connecting rod causing a substantially straight line movement of said drive arm distal end section; and

means for rotating said drive shaft.

4,317,974

SWITCH PROTECTING AND ADJUSTING ARRANGEMENT

Akira Nozaki, Toda, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed Mar. 5, 1980, Ser. No. 127,273

Claims priority, application Japan, Mar. 19, 1979, 54/35192[U]

Int. Cl.³ H01H *3/60*

U.S. Cl. 200—330 **4 Claims**

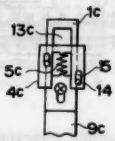
1. In an apparatus having a printed circuit board and a switch mounted on said printed circuit board and having a switch knob, the improvement comprising:

an operating lever adjacent said printed circuit board;

a movable member substantially parallel to and spaced from said printed circuit board near said switch and connected

by adjustable means to said operating lever, said movable member having parallel side edges extending longitudinally thereof and a closed perimeter through-hole spaced between said parallel side edges and extending therealong;

a slide member slidable longitudinally on said movable member, said slide member being U-shaped in plan with a bight portion extending transversely across said hole beyond said side edges of said movable member and with a pair of legs extending in parallel from opposite ends of said bight portion in slidable relation along and overlapping the side edges of said movable member, said movable member having projections in the path of said slide member preventing said slide member from covering a knob-receiving portion of said hole, spaced apart tabs fixed to and extending toward each other from (1) said bight portion of said slide member between said legs and (2) said movable member at an end of said hole remote from said knob-receiving portion of said hole;



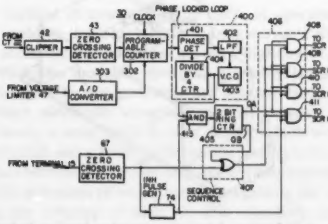
a spring spaced loosely between said legs of said slide member, said spring being enclosed in said hole laterally between said side edges of said movable member and extending from said bight portion of said slide member to said end of said hole, said spring being a compression spring having only its ends sleeved over respective ones of said tabs for urging said slide member against said projections on said movable member, said switch knob being receivable in said knob-receiving portion of said hole and snugly disposed between said side edges of said movable member and against said bight portion of said slide member.

4,317,975

INDUCTION HEATING APPARATUS WITH MEANS FOR DETECTING ZERO CROSSING POINT OF HIGH-FREQUENCY OSCILLATION TO DETERMINE TRIGGERING TIME

Takumi Mizukawa; Keizo Amagami; Mitsuyuki Kiuchi; Hirokazu Yoshida, and Tatsuo Saka, all of Kadoma, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Division of Ser. No. 749,258, Dec. 10, 1976, Pat. No. 4,145,592.
This application Dec. 26, 1978, Ser. No. 972,881
Claims priority, application Japan, Jan. 14, 1976, 51-3500
Int. Cl.[3] H05B *6/08, 6/12*
U.S. Cl. 219—10.49 R **5 Claims**



1. An induction heating cooking apparatus including a solid state switching device connected to receive power from a source of low frequency energy, a load circuit and a control circuit for triggering said switching device to generate energy of high frequency oscillations in said load circuit to produce heat in an inductive cooking ware by electromagnetic induction, said control circuit comprising:

a zero crossing detector for detecting a zero crossover point of said high frequency oscillations;

means for detecting the magnitude of the high frequency energy delivered to said inductive cooking ware;

means for establishing a setting level representing a desired energy level;

comparator means for detecting the deviation of the magnitude of the detected high frequency energy from said setting level;

a source of clock pulses;

a programmable counter for counting said clock pulses in response to the detection of each zero crossover point of said high frequency oscillations for the period of time proportional to said detected deviation of high frequency energy; and

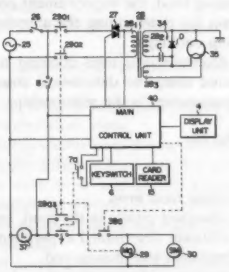
a phase-locked loop including a voltage-controlled oscillator and a phase detector receptive of the outputs of said oscillator and said programmable counter to generate a phase difference signal which is coupled to said oscillator to control the frequency thereof to reduce the difference in phase between said outputs of said counter and oscillator to zero, said switching device being responsive to the output of said voltage-controlled oscillator to generate said high frequency oscillation.

4,317,976

HIGH FREQUENCY HEATING APPARATUS

Tomimitsu Noda, Fuji, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 21, 1979, Ser. No. 50,786
Claims priority, application Japan, Jun. 28, 1978, 53-78354; Jun. 28, 1978, 53-78355; Jun. 28, 1978, 53-78357; Jun. 28, 1978, 53-78358; Jun. 28, 1978, 53-78359
Int. Cl.[3] H05B *6/68;* **G06K** *19/06*
U.S. Cl. 219—10.55 F **9 Claims**



1. In a high frequency heating apparatus including means for digitally controlling the conditions under which a foodstuff is to be cooked, the improvement comprising:

cooking card means having (a) timing and temperature indicia written along a first edge thereof and power level indicia along another edge thereof thereby defining a matrix array having a plurality of regions, each region indicating a cooking condition corresponding to either a time and power level combination or to a temperature and power level combination, one or more regions of said matrix array being selected and marked to establish data corresponding to desired cooking conditions, and (b) a data area separate and distinct from said timing, temperature and power level matrix array for selecting either said temperature indicia or said timing indicia to be used in conjunction with said power level indicia,

cooking card-reading means for reading the regions marked on the cooking card means;

memory means for storing data corresponding to the regions

marked on said card means and read therefrom by said cooking card-reading means and

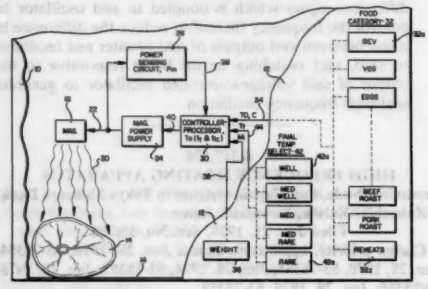
display means for displaying time, temperature and power levels data defined by the regions marked on said card means and read therefrom.

4,317,977

POWER CONTROLLED MICROWAVE OVEN

Ronald G. Buck, Burnsville, Minn., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Sep. 6, 1979, Ser. No. 73,077
Int. Cl.[3] H05B 6/68
U.S. Cl. 219—10.55 B 8 Claims



7. In a microwave oven including a microwave energy source for heating food, the improvement comprising:

sensing means for determining the absorbed power in said food during cooking;

means for determining a total cooking time of said food being heated using the determined absorbed power and cooking parameters in the relationship:

$$t_f = (M/Pa)\,Xm$$

where,

M is the initial food mass,

Pa is the absorbed power in the food, and

Xm is a constant determined experimentally for various food categories and masses; and

means for repetitively determining the value of total cooking time, t_f, and

means for de-energizing said microwave energy source when the total elapsed time is equal to the last determined total cooking time, t_f.

8. In a microwave oven including a microwave energy source for heating food, a method for controlling the cooking of said food comprising the steps of:

(a) determining the power absorbed by the food as a function of time;

(b) determining the total time required to cook the food using the absorbed power determined in step (a) and predetermined stored cooking parameters based on food type and mass;

(c) repetitively performing steps (a) and (b) during the cooking process and repetitively updating the total cooking time to adjust for any variation in absorbed power; and

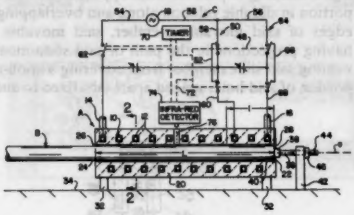
(d) de-energizing the microwave energy source when the cooking time determined in steps (a) through (c) is equal to the total elapsed time.

4,317,978

INDUCTION HEATER ARRANGEMENT FOR FORGING BAR STOCK

George C. Nebesar, Parma, Ohio, assignor to Park-Ohio Industries, Inc., Cleveland, Ohio

Filed Apr. 7, 1980, Ser. No. 137,567
Int. Cl.[3] H05B 5/02
U.S. Cl. 219—10.71 22 Claims



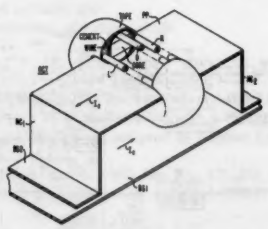
1. An induction heating apparatus for heating the end portion of an elongated workpiece to a processing temperature during a heating cycle having an initial portion of a predetermined length, said end portion having a general axial length and a terminal portion residually heated from a prior heating cycle and having an axial length substantially less than said general axial length, said apparatus comprising: an elongated multiturn inductor having a front end, a rear end, and a central workpiece receiving passageway extending between said ends and into which the workpiece is insertable from the said front end of the inductor for stationary axial positioning therein, said inductor including a linear multiturn induction heating coil coaxial with said passageway and having an effective axial heating length between said inductor ends generally matching said general axial length of said workpiece end portion, and means for preventing workpiece heating adjacent an axial segment of said inductor at said rear end during said initial portion of said heating cycle, said inductor segment receiving and corresponding generally to said axial length of said workpiece terminal portion.

4,317,979

HIGH CURRENT HIGH FREQUENCY CURRENT TRANSFORMER

William E. Frank, and Erwin A. Billman, both of Baltimore, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 30, 1980, Ser. No. 154,692
Int. Cl.[3] H05B 6/06; H01F 40/06
U.S. Cl. 219—10.77 6 Claims



1. In an induction heating apparatus having induction coil means supplied through two closely related parallel conductors with high frequency high power current from a tank circuit energized by a power generator, the combination of:

said parallel conductors having a predetermined distance therebetween along a portion thereof;

a toroidal secondary winding of Litz wire disposed along said portion and around one of said conductors in transformer relationship with said power current for deriving a coil current signal representative of said power current;

with said toroidal secondary winding including a toroidal inner magnetic core and being oriented in a plane normal to said portion;

with at least one outer cooling tube being mounted in heat transfer relation with said secondary winding by means of a thermally conductive cement extending over at least one substantial portion of the outer surface of said secondary winding and surrounding said outer cooling tube; and

means for providing an air-tight seal adjacent said thermally conductive cement by impregnation of said magnetic core and secondary winding;

said predetermined distance accommodating

(a) said impregnated toroidal secondary winding,

(b) said at least one outer cooling tube, and

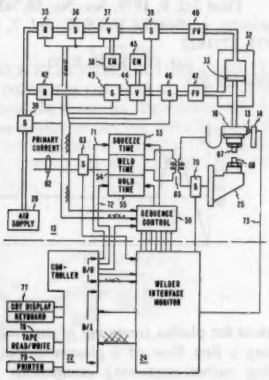
(c) said surrounding cement.

4,317,980

RESISTANCE WELDING SEQUENCE CYCLE CONTROL

Russell A. Goodrich, Grand Meadow; Larry H. Lengerman, and James K. Timbeross, both of Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 2, 1980, Ser. No. 109,021
Int. Cl.³ B23K *11/24*
U.S. Cl. 219—117.1 **15 Claims**



1. The method of controlling the cycle of operation of a resistance welding device which includes a movable electrode assembly and a cycle of operation having a flight cycle portion during which the movable electrode assembly is advanced toward the work by a motive means, a squeeze cycle portion during which electrodes are maintained in pressure contact with the work, a weld cycle portion during which weld current is activated and a hold cycle portion during which pressure contact between electrodes and work is maintained subsequent to the activation of weld current comprising the steps of:

sensing the velocity of said movable electrode assembly during said flight cycle portion,

comparing the sensed velocity to a predetermined velocity value, and

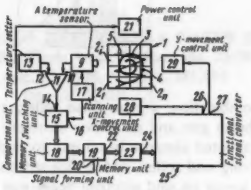
altering the length of the squeeze cycle portion as a function of the comparison of said sensed velocity to said predetermined velocity value.

4,317,981

METHOD AND APPARATUS FOR CONTROLLING A MOVABLE ENERGY SOURCE WHEN IT IS OPERATED TO HEAT THE SURFACE OF AN OBJECT

Evgeny P. Chubarov, 1 Mikrorаion, korpus 12, kv. 141, Moscow, Teply Stan; Viktor A. Kubyshkin, ulitsa Tsiolkovskogo, 2, kv. 56, Schelkovo-3, Moskovskaya oblast; Vladimir E. Mitrofanov, ulitsa Lenskaya-Timiryazeva, 12, kv. 45., Pavlovo-Posad, Moskovskaya oblast; Alexandr N. Emelyanov, ulitsa Shnyreva, 37, kv. 16, Istra, Moskovskaya oblast; Anatoly G. Butkovsky, ulitsa Butlerova, 2, korpus 2, kv. 8; Kemer B. Norkin, ulitsa Volgina, 23, korpus 1, kv. 109, both of Moscow; Anatoly G. Aizenshtein, ulitsa Bosova, 18, kv.12, Istra, Moskovskaya oblast; Margarita B. Kolomeitseva, ulitsa Baikalskaya, 30, korpus 2, kv. 49, Moscow; Arthur M. Suvorov, ulitsa Marxistskaya, 9, kv. 227, Moscow, and Sergei A. Vazhnov, ulitsa M.Kaluzhskaya, 12, kv. 57, Moscow, all of U.S.S.R.

Filed Oct. 25, 1978, Ser. No. 955,022
Claims priority, application U.S.S.R., Oct. 31, 1977, 2542762
Int. Cl.³ B23K *15/00*
U.S. Cl. 219—121 EA **11 Claims**



1. A method for controlling heating of an object by a movable energy source having a controllable speed and a controllable power, comprising:

dividing the surface of the object into a plurality of elemental areas;

measuring the temperature of each of said elemental areas in a first pattern;

separately storing temperature signals related to the temperatures of said elemental areas;

moving said energy source over the surface of said object in a second pattern different from said first pattern;

controlling the velocity of said energy source as it passes over each particular elemental area in accordance with the respective stored temperature signal of said particular elemental area; and

controlling said power of said energy source in accordance with at least one of the stored temperature signals.

9. Apparatus for heating an object comprising:

a movable energy source having a controllable speed and a controllable power;

means for defining a plurality of elemental areas on a surface of said object;

means for measuring the temperature of each of said elemental areas in a first pattern;

means for separately storing temperature signal related to the temperatures of said elemental areas;

means for moving said energy source over said surface of said object in a second pattern different from said first pattern;

means for controlling the velocity of said energy source as it passes over each particular elemental area in accordance with the respective stored temperature signal of said particular elemental area; and

means for controlling said power of said energy source in accordance with at least one of the stored temperature signals.

4,317,982

ORIFICE FOR COUPLING AN ELECTRON BEAM GUN TO PRINT FORM CYLINDERS

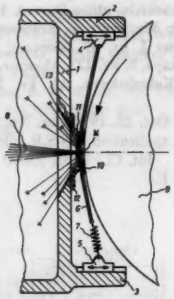
Heinz Taudt; Dieter Grieger, both of Kiel, and Siegfried Beiswenger, Preetz, all of Fed. Rep. of Germany, assignors to Dr. Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

Filed May 3, 1979, Ser. No. 35,688

Claims priority, application Fed. Rep. of Germany, May 8, 1978, 2819993; Aug. 5, 1978, 2834457

Int. Cl.³ B23K *15/00*

U.S. Cl. 219—121 EN **23 Claims**



1. In combination, a print form roller, a highly-evacuated electron beam gun and an orifice structure for coupling said highly-evacuated electron beam gun to said print form roller for engraving said roller, said orifice structure comprising:

an end cover on said electron beam gun including a beam passing opening for receiving the electron beam therethrough and a forwardly-extending cover extension; and

flexible band means carried by said cover extension, and slidingly engaging said roller, said band means including an opening aligned with said opening of said end cover.

4,317,983

SETTING THE ELECTRON GUN CATHODE HEATING CURRENT OF AN ELECTRON BEAM MACHINE

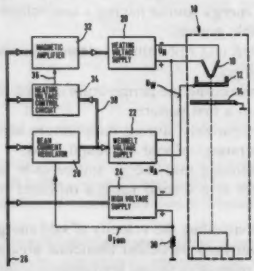
Wilhelm Scheffels, Puchheim, and Ruprecht Hoffmann, Oberschweinbach, both of Fed. Rep. of Germany, assignors to Steigerwald Strahltechnik GmbH, Puchheim, Fed. Rep. of Germany

Filed Oct. 10, 1979, Ser. No. 83,384

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1978, 2844183

Int. Cl.³ H05B *39/04, 41/36;* **B23K** *15/00*

U.S. Cl. 219—121 EA **11 Claims**



1. In an electron beam machine with an electron gun including a cathode, a Wehnelt electrode, and a beam current, a method for setting a cathode heating current comprising the steps of:

stabilizing the beam current by Wehnelt voltage control; and

setting the cathode heating current on the basis of the dependence of the Wehnelt voltage to the heating current while the beam current is stabilized.

6. An electron beam machine with a beam current and an electron gun containing a heated cathode, a Wehnelt electrode responsive to a Wehnelt voltage to control the beam current and at least one anode, and a beam regulator acting on the Wehnelt voltage, comprising:

(a) first means **(32, 40)** to vary a cathode heating current (I_H) supplied to said heated cathode;

(b) a second means **(44)** to determine changes of the Wehnelt voltage (U_W) which are necessary in order to keep the beam current constant; and

(c) third means **(70, 76)** which responds to a rate comprising the change of the Wehnelt voltage to the variation of cathode heating current to terminate the variation of the heating current at a predetermined value of said ratio and maintain said heating current at a constant level.

4,317,984

METHOD OF PLASMA TREATMENT OF MATERIALS

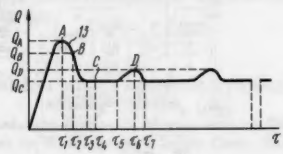
Mikhail G. Fridlyand, ulitsa Pestelya, 11, kv. 139, Leningrad, U.S.S.R.

Filed Jul. 9, 1979, Ser. No. 55,743

Claims priority, application U.S.S.R., Jul. 7, 1978, 2630652; Feb. 21, 1979, 2721822

Int. Cl.³ B23K *9/00*

U.S. Cl. 219—121 PU **15 Claims**



1. A method for plasma treatment of materials comprising:

introducing a first flow of a plasma-forming gas mixture including carbon-containing compounds selected from hydrocarbons in the amount of from $(0.5\times10^{-3})/n$ l/amp-sec to $(6\times10^{-3})/n$ l/amp-sec, into the space between the electrodes of an electric arc device to provide deposition of carbon at least on one of the electrodes of the electric arc device in the course of arc burning, where "n" is a number of atoms of carbon in the employed carbon-containing compound, said amount depending on the chemical affinity of an oxidizing agent for said carbon-containing compound;

striking an electric arc;

measuring a quantity of heat flowing into one of said electrodes upon which carbon is deposited;

detecting a peak in said quantity of heat;

adding a second flow of an oxidizing agent to said first flow beginning at said peak;

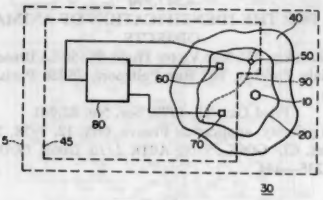
substantially reducing said second flow when said heat flow drops down to a steady value, whereby stable and reliable arc burning is provided.

4,317,985

DUAL HEATER STABILIZATION APPARATUS AND METHOD FOR A CRYSTAL OVEN

Robert L. Wilson, Santa Clara, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 29, 1979, Ser. No. 43,293
Int. Cl.[3] H05B *3/00*
U.S. Cl. 219—210 8 Claims



1. A method for controlling the temperature of an oven having a temperature sensitive element mounted to a thermally conductive base, the method comprising the steps of:

sensing the temperature of the thermally conductive base at a first position;

heating the base at a second position, the power applied to the second position being responsive to the temperature sensed at the first position;

heating the base at a third position, the power applied to the third position being a multiple of the power applied to the second position;

sensing a temperature responsive signal from the temperature sensitive element; and

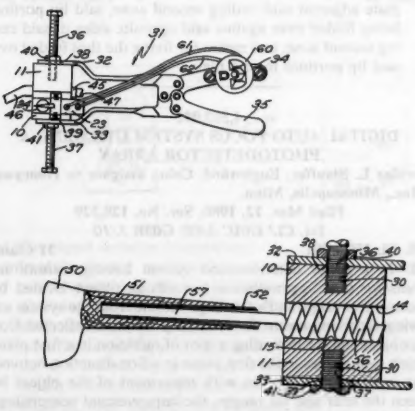
adjusting the multiple in response to the temperature responsive signal.

4,317,986

CONVERTIBLE ELECTRICALLY HEATED TOOL FOR REMOVING WOODEN OR METAL GOLF CLUB HEADS

Daniel A. Sullivan, 24 Potter St., Pawtucket, R.I. 02860

Continuation-in-part of Ser. No. 949,623, Oct. 10, 1978, abandoned. This application Jun. 12, 1979, Ser. No. 47,929
Int. Cl.[3] H05B *1/00;* B32B *35/00;* B23P *19/00*
U.S. Cl. 219—231 4 Claims



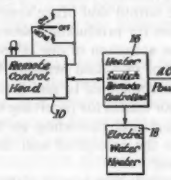
1. An electrically heated convertible tool for removing a golf club head hosel from a shaft in the hosel of both metal and wooden golf club heads, said tool comprising plier-like pivotally connected opposed jaws, each with a threaded opening therethrough and each with an actuating handle, a pair of heating blocks, each block having a threaded recess and being secured to a different one of said jaws by a threaded member threaded through the threaded opening of the jaw into the threaded recess of the block, a lock nut on each threaded member cooperating with the jaw to lock the threaded member relative to the jaw, said blocks being adapted to be disposed in opposed clamping relationship around the hosel of a metal club head and each being providing with an arcuate recess facing the recess of the other block, said recesses being sized to engage the tapered hosel surface of the metal golf club head, an electrical heating element in each block for heating the block and thereby the hosel received in the arcuate recess, said blocks being selectively adjustable toward and away from each other by said threaded members to accomodate for size variations in hosels, an elongated heat exchange member having a head sized to be clamped in said arcuate recesses of said blocks in contact with the walls of the recesses, said member having an elongated linear portion extending from said head and being of a size to extend into the interior of a hollow metal golf club shaft secured in the hosel of a wooden club head, whereby the elongated heat exchange member may be ommitted for use with a metal head club and is used for insertion in broken-off metal shaft of the hosel of a wooden head club.

4,317,987

REMOTE CONTROL DEVICE FOR A WATER HEATER

Dan I. Fieldman, 305 Circle West, Jupiter, Fla. 33458

Filed Aug. 27, 1980, Ser. No. 181,884
Int. Cl.[3] H05B *1/02*
U.S. Cl. 219—506 6 Claims



1. A remote control device for controlling the mode of operation of an electrical water heater, comprising:

a thermostatically controlled switch, said thermostatically controlled switch having an open position and a closed position, said thermostatically controlled switch electrically coupled to a power source through a power cable; an electrical water heater having a heating element, said heating element connected within said water heater and electrically coupled to said thermostatically controlled switch; an indicating means for indicating the status of said water heater; a first control means for manually selecting the mode of operation of said water heater and controlling said indicating means, said first control means includes a multi-positional manual switch having at least a first position, a second position and a third position; said indicating means electrically coupled to said first control means; a second control means for controlling the power to said water heater, said second control means having at least a first pair of control terminals, a first output and a first input, said second control means controlled by said first control means; said first pair of control terminals electrically coupled to said first control means; said first input electrically coupled to said power source; said first output electrically coupled to said electric power cable, said second control means maintaining said water heater in an off condition when said manual switch is in said first position; said second control means allowing said water heater to turn on for one heating cycle whenever said thermostatically controlled switch is closed and said manual switch is in said second position; said second control

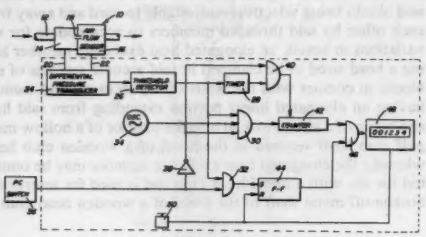
means allowing said water heater to operate in the conventional mode controlled solely by said thermostatically controlled switch, whenever said manual switch is in said third position.

4,317,988

AIR BRAKE LEAK LOCATOR

Rosser L. Wilson, 103 Armour Rd., Mahwah, N.J. 07430

Filed May 25, 1979, Ser. No. 42,498
Int. Cl.³ B60T *17/00*; G06M *3/08*
U.S. Cl. 235—92 MT 8 Claims



1. In a vehicular fluid pressure brake system having a main supply line connected to a plurality of serially connected braking mechanisms, a fluid pressure leak detector for determining the location of a fluid pressure leak in said brake system, said fluid pressure leak detector comprising:

first sensor means connected in said supply line for producing a first signal indicative of initiation of a fluid pressure leak and being operable in response to an abnormal change in fluid pressure within said brake system;

second sensor means for producing a second signal operable in response to an actuation of one of said braking mechanisms as a result of said fluid pressure leak;

elapsed time means connected to said first sensor means and said second sensor means for receiving said first signal and said second signal and providing an indication of time elapsed between the receipt of said first signal and said second signal; and

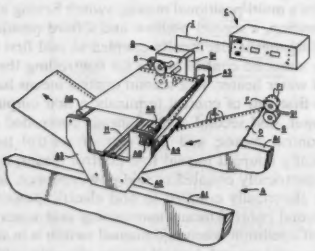
time delay means connected to said elapsed time means for delaying receipt of said first signal by said elapsed time means by a predetermined amount to cancel normal brake system charging.

4,317,989

APPARATUS AND METHOD FOR MEASUREMENT OF BOARD LENGTH

Jack Sargent, Silver Spring, Md., assignor to Innovative Design, Inc., Silver Spring, Md.

Filed Jun. 1, 1979, Ser. No. 44,384
Int. Cl.³ G06M *3/12*
U.S. Cl. 235—92 DN 42 Claims



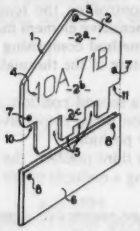
1. For use in a system having a running web with a multiplicity of reference marks substantially equally spaced along its length, apparatus for measuring deviation of a reference length of the web from a standard length, comprising means for counting the number of reference marks that pass a predetermined location, means for concurrently measuring the length of the web that moves past said location, means for detecting when said counting attains a predetermined value, and means for producing an output dependent upon the state of the length measuring means when said value is attained.

4,317,990

LABEL FOR THE IDENTIFICATION OF ANIMALS OR OBJECTS

Tadeusz Zmokly, 151 Rue Victor Hugo, 93150 Le Blanc-Mesnil, and Alain Porcher, 107 Rue Pelleport, 75020 Paris, both of France

Filed Oct. 11, 1979, Ser. No. 83,941
Claims priority, application France, Oct. 12, 1978, 78 29111
Int. Cl.³ G06K *19/06*; A01K *1/10*; G06K *19/00*
U.S. Cl. 235—494 8 Claims



1. A label for the identification of an animal or an object, said label comprising:

a plate;

means for attaching said plate to an animal or object to be identified;

said plate including a first zone provided with directly intelligible clear information and a coding second zone provided with unintelligible identification information in coded form; and

a cover covering opposite sides of said coding second zone, said cover comprising two spaced apart lip portions of said plate, said lip portions extending from an edge of said plate adjacent said coding second zone, said lip portions being folded over against said opposite sides of said coding second zone, and means for fixing the thus folded over said lip portions to said plate.

4,317,991

DIGITAL AUTO FOCUS SYSTEM UTILIZING A PHOTODETECTOR ARRAY

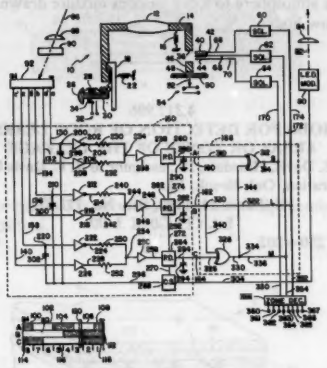
Norman L. Stauffer, Englewood, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 12, 1980, Ser. No. 129,529
Int. Cl.³ G01C *3/08*; G03B *3/10*
U.S. Cl. 250—201 31 Claims

1. In a range determination system having transmitting means for directing radiation towards an object located between a near range and a far range remote from the system and having receiving means for receiving radiation reflected from the object and for providing a spot of radiation in a first plane, which spot moves in the first plane in a first direction between first and second positions with movement of the object between the near and far ranges, the improvement comprising:

a plurality of radiation responsive detectors each having first and second end portions and each detector being operable to produce an output signal upon receipt of radiation between the first and second end portions, said detectors being mounted in the first plane between the first and

second positions and being arranged in at least two parallel rows along the first directiion so that as the spot moves in the first direction radiation therein will fall on all rows simultaneously said detectors being positioned in the rows



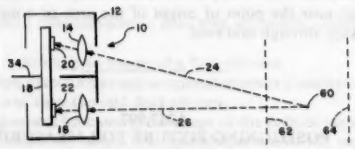
so that when the spot falls within the first and second positions on a first or second end portion of a detector in any row, it will not fall on a first or second end portion of any detector in any other row.

4,317,992

OBJECT DETECTING APPARATUS

Norman L. Stauffer, Englewood, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 10, 1979, Ser. No. 101,602
Int. Cl.³ G01V *9/04*
U.S. Cl. 250—221 **10 Claims**



1. An object detector comprising:

a module fixedly positioned to receive visible radiation which exists normally in a predetermined scene, the module being set to be focussed at a first distance so as normally to produce an output signal having a first characteristic, the output signal changing from the first characteristic to a second characteristic when an intruding object which reflects the normally existing radiation enters the scene at other than the first distance; and

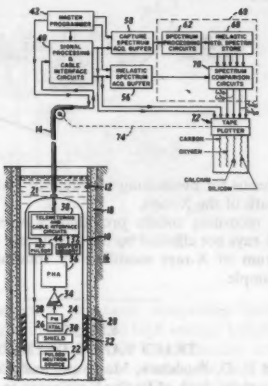
comparing means connected to the module to receive the output signal and operable to detect the change from the first characteristic to the second characteristic and to produce a resultant signal indicative of the presence of the intruding object.

4,317,993

METHODS AND APPARATUS FOR CONSTITUENT ANALYSIS OF EARTH FORMATIONS

Russel C. Hertzog, Jr., Ridgefield, and William B. Nelligan, Danbury, both of Conn., assignors to Schlumberger Technology Corporation, New York, N.Y.

Continuation of Ser. No. 869,584, Jan. 16, 1978, abandoned. This application May 18, 1979, Ser. No. 40,320
Int. Cl.³ G01V *5/00*
U.S. Cl. 250—270 **58 Claims**



1. A method for investigating the composition of an earth formation traversed by a well bore, comprising the steps of:

(a) repetitively irradiating the formation with time-spaced bursts of fast neutrons;

(b) detecting gamma rays during first time periods related to the occurrence of the neutron bursts such that the detected gamma rays result predominately from inelastic scattering interactions between the incident neutrons and constituents of the formation;

(c) detecting background gamma rays during second time periods between neutron bursts during which the detected gamma rays result predominately from interactions between incident neutrons and constituents of the formation other than inelastic scattering interactions;

(d) generating an energy spectrum of the predominately inelastic scattering gamma rays detected in step (b);

(e) generating an energy spectrum of the background gamma rays detected in step (c);

(f) utilizing the background gamma ray spectrum to provide one or more standard background gamma ray spectra; and

(g) comparing the predominately inelastic scattering gamma ray spectrum with a composite spectrum, made up of weighted standard spectra of constituents postulated to have contributed to said inelastic scattering gamma ray spectrum and including among said standard spectra said one or more standard background spectra, to determine the proportions in the formation of the postulated constituents.

4,317,994

LASER EXAFS

Philip J. Mallozzi, Delaware; Harold M. Epstein; Robert E. Schwerzel, both of Columbus, and Bernerd E. Campbell, Upper Arlington, all of Ohio, assignors to Battelle Memorial Institute, Columbus, Ohio

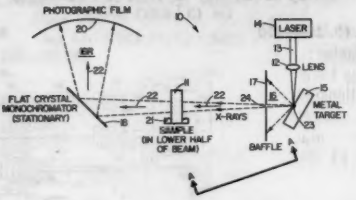
Filed Dec. 20, 1979, Ser. No. 105,816
Int. Cl.³ G01N *23/20*
U.S. Cl. 250—275 **20 Claims**

1. Apparatus for obtaining EXAFS data of a material, comprising

means for directing radiant energy from a laser onto a target

in such manner as to produce X-rays at the target of a selected spectrum and intensity, suitable for obtaining the EXAFS spectrum of the material,

means for directing X-rays from the target onto spectral dispersive means so located as to direct the spectrally resolved X-rays therefrom onto recording means, and



means for positioning a sample of material in the optical path of the X-rays,

the recording means providing a reference spectrum of X-rays not affected by the sample and an absorption spectrum of X-rays modified by transmission through the sample.

4,317,995

TRACE VAPOR DETECTOR

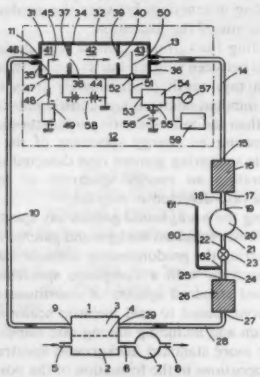
Robert F. D. Bradshaw, Markyate, and John L. Brokenshire, Amersham, both of England, assignors to U.S. Philips Corp., New York, N.Y.

Filed May 19, 1980, Ser. No. 151,219

Claims priority, application United Kingdom, Jun. 21, 1979, 21678/79

Int. Cl.³ B01D *59/44*; H01J *49/00*

U.S. Cl. 250—288 **11 Claims**



1. Apparatus for detecting trace quantities of a chemical species in a gaseous mixture by drawing the gaseous mixture through a hollow body, said hollow body having serially arranged an inlet, a first, a second and a third internal region and an outlet, the first region containing means for ionising a proportion of the molecules of the gaseous mixture including molecules of the chemical species and means for selecting ions of one polarity for travel with the gaseous mixture into the second region, means for promoting the flow of the gaseous mixture through the second region as a jet of substantially uniform velocity, means for producing in the second region an electric field which urges ions of the selected polarity in a direction opposite to that of the gas flow and means in the third region for collecting ions of the selected polarity, the arrangement being such that, in operation, ions of the selected polarity whose ionic mobilities exceed a value dependent on the strength of said electric field and the velocity of the gas flow can be prevented from entering the third region characterised by means for transferring molecules of the chemical species from the atmosphere to a dry gaseous mixture drawn through the hollow body.

4,317,996

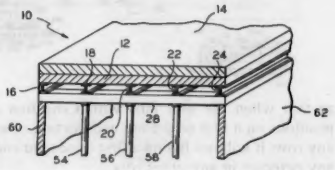
METHODS FOR DETECTION OF ROOF LEAKS AND AREAS OR ZONES OF THE LEAKAGE

Robert E. Davis, Hinsdale, Ill., assignor to R. E. Davis Chemical Corporation, Oak Brook, Ill.

Filed Jan. 14, 1980, Ser. No. 111,872

Int. Cl.³ G09K *3/00*

U.S. Cl. 250—302 **9 Claims**



1. A method for detection of an area or zone of water leakage through the roof of a walled or unwalled building, which comprises applying on all or part of a roof known to have, or suspected of having, water leakage therethrough a sufficient amount of water, having a fluorescent dye dissolved or dispersed therein, to cause said dye-containing water to flow through a roof leak point or zone onto the underside of the roof, and/or roof-penetrating structures, and/or roof support structures and/or the walls of the building beneath the roof, said fluorescent dye-containing water being applied in the form of a spray in a stream of air moving at a velocity of at least about 20 miles per hour; thereafter shining onto the underside of said roof, and/or said roof-penetrating structures, and/or said support structures and/or surfaces of walls of the building a light having a frequency band or spectrum which induces said dye to fluoresce; and tracing the path of fluorescence along the underside of said roof, and/or roof-penetrating structures, and/or roof support structures and/or the building wall to or near the point of origin of the area or zone of water leakage through said roof.

4,317,997

POSITIONING FIXTURE FOR MEASURING INSTRUMENTS

John E. Tiebor, Williamsville; Jerry J. Spongr, Tonawanda, and Ralph J. Dalfonso, Alden, all of N.Y., assignors to Twin City International, Inc., Amherst, N.Y.

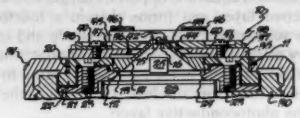
Filed May 21, 1980, Ser. No. 151,785

Int. Cl.³ G01N *23/00*

U.S. Cl. 250—308 **9 Claims**

1. A component positioning fixture for use with a measuring system utilizing radiation and having a platen with an apertured seat for receiving the component being measured, said fixture comprising a base plate having an opening therethrough for the apertured seat of the platen, means for both radially and circumferentially alining said base plate with the platen, at least one component positioning member carried by said base plate, said positioning member being selectively laterally adjustable along a first axis substantially perpendicu-

lar to the axis of said opening for proper positioning of a component to be measured on the apertured seat of the platen, and



means for releasably securing said positioning member in adjusted position.

4,317,998

INFRA-RED LINE-SCANNING TARGET DETECTORS

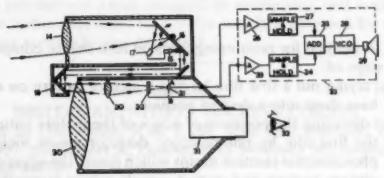
Marcus J. Dore, Bournemouth, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Jun. 10, 1976, Ser. No. 694,030

Claims priority, application United Kingdom, Jun. 18, 1975, 26048/75

Int. Cl.³ G01J *1/00*

U.S. Cl. 250—347 **9 Claims**



1. Scanning radiation-source detecting apparatus, comprising

means for forming an image of a field-of-view,

a radiation detector having an optical aperture considerably narrower than the said field-of-view,

scanning means for causing the image of the field-of-view to move relatively across the optical aperture of the radiation detector,

means for deriving a general response signal in response to radiation received from any part of the field-of-view,

means for deriving a central response signal in response to radiation received from a central part of the field-of-view, and

audio-signal generating means for producing audio signals of a variable frequency dependent on the magnitude of the response of said radiation detector to radiation from the central area of the field-of-view, said audio-signal generating means comprising a fixed-frequency audio oscillator controlled by the general response signal and a variable-frequency audio oscillator connected to produce an audio signal of a frequency dependent on the magnitude of the central response signal.

4,317,999

X-RAY DIAGNOSTIC GENERATOR COMPRISING SWITCHING MEANS FOR SWITCHING-ON AND -OFF THE HIGH VOLTAGE TRANSFORMER

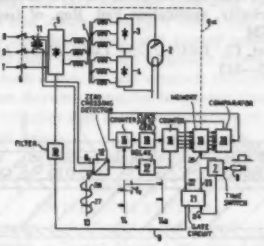
Heribert Amtmann, Langensendelbach, and Klaus Baeker, Utenreuth, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 6, 1979, Ser. No. 100,849

Claims priority, application Fed. Rep. of Germany, Jan. 9, 1979, 2900623

Int. Cl.³ H05G *1/30*

U.S. Cl. 250—413 **3 Claims**



1. An x-ray diagnostic generator comprising switching means for switching-on and -off of a high voltage transformer at predetermined times, characterized by a switching arrangement (12 through 21) for the purpose of storage of information which corresponds to the switch-off phase angle of the supply voltage, and for the purpose of switching-on at a phase position of the supply voltage which is equal to the respectively stored phase angle.

4,318,000

METHOD OF AND DEVICE FOR IRRADIATING ANIMALS

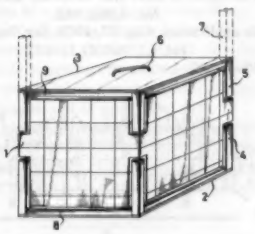
Charles A. Sondhaus, Corona del Mar, Calif., assignor to Kernforschungsanlage Jülich GmbH, Jülich, Fed. Rep. of Germany

Filed Oct. 5, 1979, Ser. No. 82,061

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1978, 2844041

Int. Cl.³ G01N *21/00, 23/00*

U.S. Cl. 250—455 **9 Claims**



1. A device for the irradiation of animals, especially experimental animals, which comprises a cage for receiving said animals and formed with a ceiling member along a top of the cage, a floor member along the bottom of said cage, an openwork between said members around the periphery and along the top and bottom of the cage, said openwork forming side, top and bottom walls of the cage, and at least one planar irradiator provided as one of said member and having a removable plate formed with radiation sources in the form of radioactive wire sections distributed over the area of said one of said members to form a uniform radiation field over the area of said

one of said members, said one of said members being provided with positioning elements at the corners thereof engageable with the openwork structure to removably mount said planar irradiator on the cage.

4,318,001

LUMINESCENT MATERIALS WITH INCREASED HUMIDITY STABILITY

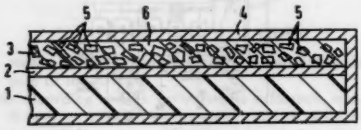
Heinz Degenhardt, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 16, 1980, Ser. No. 150,600

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1979, 2927428

Int. Cl.³ G01N *21/64*; C09K *11/24, 11/46*

U.S. Cl. 250—483 **3 Claims**



1. In an x-ray intensifier foil comprised of a substrate, a reflective layer on a surface of said substrate, a luminescent layer on said reflective layer and a protective layer at least on said luminescent layer, the improvement comprising wherein:

said luminescent layer is comprised of humidity-stabilized activated rare-earth oxybromide crystals, each coated with a layer comprised of a double salt selected from a group consisting of:

$M^{I}La(SO_4)_2$; $M^{I}_3La(SO_4)_3$; $M^{III}La(SO_4)_3$ and mixtures thereof, wherein M^{I} is an alkali-metal and M^{III} is an earth metal, and a compatible bonding agent.

4,318,002

METHOD OF CHARGING A MULTILAYERED APERTURED ELEMENT IN AN ELECTROSTATIC IMAGING PROCESS

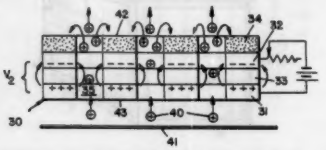
Gerald L. Pressman, San Jose, and Kenneth W. Gardiner, Menlo Park, both of Calif., assignors to ElectroPrint, Inc., Sunnyvale, Calif.

Division of Ser. No. 739,403, Nov. 8, 1976, Pat No. 4,181,423, which is a division of Ser. No. 410,743, Oct. 29, 1973, Pat. No. 4,006,983.

This application Aug. 27, 1979, Ser. No. 70,075

Int. Cl.³ G03G *13/052*

U.S. Cl. 250—492.2 **1 Claim**



1. A method of uniformly charging a multilayer apertured element having first and second conductive layers interposed with an insulator layer and a photoconductive layer superposed on said second conductive layer, the steps of which comprise:

biasing the insulator layer to establish a first layer of charge in the second conductive layer adjacent the insulator layer and further to establish a second layer of charge in the first conductive layer which is substantially equal in magnitude and opposite in polarity to the first charge layer so that electrostatic fields of force exist in the apertures:

introducing ions into the apertures from a first side adjacent the first conductive layer, the ions having a polarity the same as the polarity of the second charge layer so that the ions tend to be accelerated through the apertures onto said photoconductive layer to form a third layer of charge which attracts equal and opposite charges into said second conductive layer and forms therein a fourth layer of charge substantially equal in magnitude and opposite in polarity to the third charge layer and establishes electrostatic fields of force in the apertures tending to block the passage of ions from the first side through the apertures onto the photoconductive layer;

and continuing to introduce the ions into the apertures from the first side until the electrostatic fields of force formed by the third and fourth charge layers reaches a magnitude blocking the passage of additional ions to the apertures from the first side onto the photoconductive layer.

4,318,003

METHOD AND MACHINE FOR POSITIONING FILMS ON BASE SHEETS

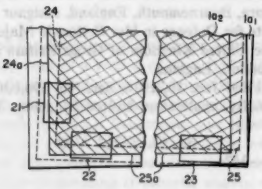
Yoshio Ono; Takashi Sakamoto, and Tetsuo Sano, all of Kyoto, Japan, assignors to Dainippon Screen Seizo Kabushiki Kaisha, Kyoto, Japan

Filed Apr. 11, 1980, Ser. No. 139,209

Claims priority, application Japan, Feb. 14, 1979, 54-14911; Apr. 16, 1979, 54-46499

Int. Cl.³ G01N *21/86*

U.S. Cl. 250—548 **12 Claims**



1. A method for positioning films on base sheets, comprising the steps of:

(a) laying out a first film having a picture pattern on a first base sheet into a desired position;

(b) detecting the positions of edges of the picture pattern in the first film by photoelectric detector means including photoelectric element means which detect the edges of the picture pattern and output signals whose strengths are varied depending on the positions of the photoelectric element means with respect to the edges;

(c) overlaying a second film having a picture pattern of the same shape as that in the first film on a second base sheet to the first film so that the edges of the picture pattern in the second film may approximately overlap to those in the first film; and

(d) moving the second film by a drive means so that the edges in the second film may completely be coincident with those in the first film depending on the output signals from the photoelectric element means, thereby positioning the second film into the desired position.

4,318,004

METHOD OF PUMPING UP ELECTRIC POWER GENERATION AND AN APPARATUS THEREFOR

Sachio Tsunoda, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Apr. 20, 1979, Ser. No. 31,786

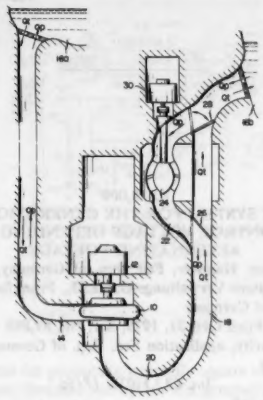
Claims priority, application Japan, May 2, 1978, 53-53039

Int. Cl.³ F03B *3/10*

U.S. Cl. 290—52 **2 Claims**

1. A method of pumping-up power generation employing a

single-speed reversible pump-turbine in which the direction of a water current is reversed when the mode of operation is switched between turbine and pump operations and a booster pump, comprising generating electric power by supplying said water current directly to said pump-turbine without passing said current through said booster pump to drive said pump-turbine and a generator-motor coupled thereto at time of power generation, and pumping up water by joint operation of said pump-turbine and said booster pump, with said booster pump connected in series with a passage of said water current introduced into said pump-turbine which is driven by said generator-motor to rotate at time of pumping; the average of the pump total head of said pump-turbine for pump operation being selected at a value obtained by multiplying the average of the turbine net head affecting said pump-turbine at time of pump operation thereof by a multiplier ranging from 0.82 to 1.00, the average of the pump total head of said booster pump being selected at a value obtained by multiplying said average of the turbine net head by a value which is obtained by subtracting said multiplier from 1.05.



4,318,005

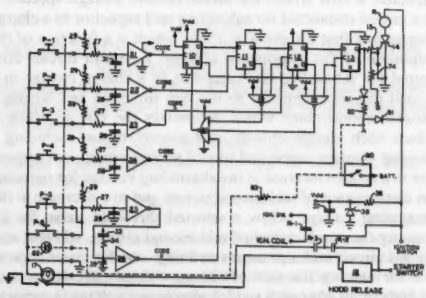
DIGITAL ANTI-THEFT LOCKING CIRCUIT

James D. Heckelman, R.R. 1 Old State Rd., Norwalk, Ohio 44857, and Robert A. Ziemke, 1813 Sandusky St., Sandusky, Ohio 44870

Continuation-in-part of Ser. No. 870,338, Jan. 18, 1978, abandoned. This application Sep. 26, 1979, Ser. No. 79,167

Int. Cl.³ H02J *1/00, 13/00*

U.S. Cl. 307—10 AT **11 Claims**



5. In a security system of the type having a plurality of switches which supply signals to an electronic discriminating circuit which when received in proper sequence provides an unlocking output signal, four code providing switches, at least two noncode providing switches first means having four clocking inputs which must be energized in a predetermined sequence and a reset input, each of said four clocking inputs having a respective Schmitt trigger connected thereto, four circuits respective ones of which connect respective code providing switches to respective Schmitt triggers, each of said four circuits having a resistance of equal value therein, three of said circuits being connected to ground by condensers of a first value and a fourth of said circuits being connected to ground by a condenser of a second greater value, second means having respective inputs for said noncode providing switches and which isolates said inputs from each other, and providing a reset signal to said first means, said second means having a resistance of the same value as the resistance in one of said four circuits and which is seen by said noncode switches, and having a condenser therein connected to ground that is seen by said noncode switches that is of a capacitance of one of said first and second values.

4,318,006

SWITCHING SYSTEM

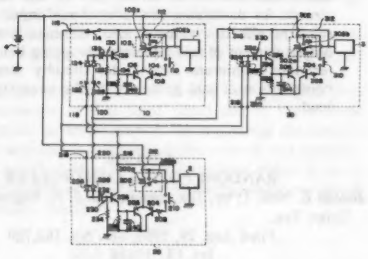
Yoshiharu Himeno, and Masaki Kubota, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Sep. 9, 1980, Ser. No. 185,644

Claims priority, application Japan, Sep. 14, 1979, 54-117355

Int. Cl.³ H01H *47/32*

U.S. Cl. 307—38 **4 Claims**



1. A switching system for selectively connecting a plurality of electric devices to a power source, comprising:

(a) a plurality of switching circuits associated with respective said electric devices, each of said switching circuits being operable to connect its associated electric device to said power source while simultaneously placing the other switching circuits out of operation; and

(b) a holding circuit for holding a switching circuit associated with one of said electric devices in operation while permitting another switching circuit to operate when said one electric device is in a predetermined mode of operation.

4,318,007

CIRCUIT ARRANGEMENT FOR CONTROLLING THE ENERGIZATION OF A LOAD FROM A PLURALITY OF CURRENT SOURCES

Luigi Rizzi, Milan, Italy, assignor to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed Jun. 11, 1980, Ser. No. 158,511

Claims priority, application Italy, Jun. 12, 1979, 23477 A/79

Int. Cl.³ H02J *1/10*

U.S. Cl. 307—44 **7 Claims**

1. In a system for energizing a load with a substantially constant voltage from a plurality of direct-current sources connected in parallel thereacross with interposition of respec-

tive isolating diodes, each source including a current generator with an output voltage which is substantially independent of output current up to a certain maximum current, each source further including voltage-regulating means with a feedback connection across the load for comparing the load voltage with a reference level and for controlling said current generator to maintain the output voltage thereof at said reference level,

the improvement wherein said voltage-regulating means comprises:

comparison means with a first input circuit including said feedback connection supplying a first input voltage proportional to load voltage and a second input circuit connected to a supply of second input voltage representing said reference level, said generator having a control input connected to said comparison means;

current-sensing means in series with said generator; and

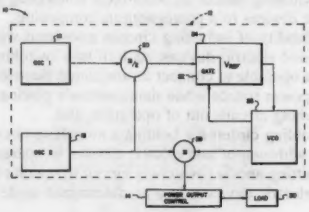
electronic switch means responsive to said current-sensing means and connected across part of one of said input circuits for modifying the ratio of said input voltages to raise the effective value of said reference level upon the output current of said generator dropping below a predetermined minimum magnitude, thereby increasing the contribution of said generator to the energization of the load.

4,318,008

RANDOM POWER CONTROLLER

Joseph E. Nall, Tyler, Tex., assignor to J. N. Engineering, Inc., Tyler, Tex.

Filed Aug. 29, 1980, Ser. No. 182,780
Int. Cl.³ H03K *3/84*
U.S. Cl. 307—84 **14 Claims**



6. An apparatus for providing a randomly varying power to a load, which comprises:

a first oscillator having a periodic output;

a second oscillator having a periodic output;

an averager having an output proportional to the sum of the first periodic output and the second periodic output;

a sample and hold unit which provides a reference voltage proportional to a sampled value of the output of said averager;

a third oscillator having a periodic output, wherein the frequency of the third periodic output is controlled by the reference voltage, and which supplies a sampling signal to said sample and hold unit, wherein the averager output is sampled when the sample and hold unit receives the sampling signal;

a summer which adds the output voltages of said second oscillator and said third oscillator;

a circuit for providing power to a load; and,

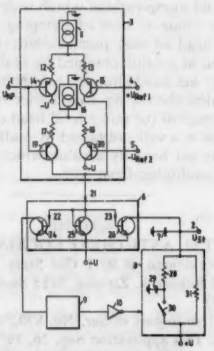
means coupled to said summer for controlling said output circuit, such that power transmitted to the load is proportional to the output voltage of said summer.

4,318,009

CIRCUIT SYSTEM FOR THE GENERATION OF A DIRECT CONTROL VOLTAGE DEPENDING UPON AN ALTERNATING VOLTAGE

Ernst Schröder, Hanover, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 31, 1979, Ser. No. 89,895
Claims priority, application Fed. Rep. of Germany, Nov. 23, 1978, 2850736
Int. Cl.³ H03K *17/56*
U.S. Cl. 307—246 **7 Claims**

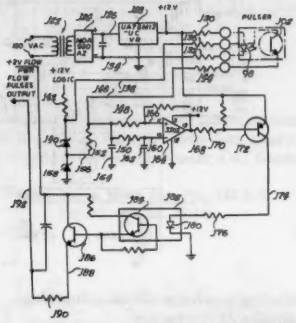


1. A circuit system for generating a direct control voltage dependent upon an alternating voltage, comprising: a charging capacitor across which the direct control voltage appears; a first circuit connected for subjecting said capacitor to a charge change in a first direction at a rate which is a function of the amplitude of the alternating voltage; a second circuit connected for subjecting said capacitor to a charge change in a second direction opposite to the first direction and having a variable conductance which determines the rate at which it effects such charge change, and control means including a time-lag element connected to said second circuit and responsive to a sudden increase in the alternating voltage for reducing the conductance of said second circuit and to a decrease in the alternating voltage below a selected threshold value for increasing the conductance of said second circuit; wherein said second circuit includes means defining a buffer circuit operative for causing the rate of charge change effected by said second circuit after such sudden alternating voltage increase to vary as a function of the duration of the time interval between such sudden increase and a succeeding decrease in the alternating voltage below the selected threshold.

4,318,010
APPARATUS FOR PRODUCING SQUARE SHAPED PULSES FROM A GENERALLY SINUSOIDALLY SHAPED SIGNAL

George L. Hurley, III, Alpine, and Michael S. Krystek, Spring Valley, both of Calif., assignors to General Atomic Company, San Diego, Calif.

Division of Ser. No. 870,115, Jan. 17, 1978, Pat. No. 4,182,953.
This application Sep. 13, 1979, Ser. No. 75,273
Int. Cl.³ H03K 5/01, 3/42
U.S. Cl. 307—261 5 Claims



1. Apparatus for producing generally square shaped electrical pulses from alternate half cycles of a generally sinusoidally shaped signal produced by a transistor, comprising:

a first Zener diode having its cathode connected to the transistor collector through a first resistance means and its anode connected to the transistor emitter through at least a second resistance means;

a second Zener diode having its cathode connected to said first diode anode and its anode connected to ground, said first and second Zener diodes limiting the voltage fluctuations of the collector-emitter circuit between first and second values during conduction and nonconduction of said transistor;

comparator means having first and second inputs and an output and providing a first output voltage level when the first input voltage level is below the second input voltage level, and a second output voltage level when said first input voltage level exceeds the second input voltage level, said first input being connected to the emitter of said transistor through at least one resistor to thereby receive an input voltage that varies in proportion to said first and second transistor collector-emitter voltage values; and,

integrator means connected through a third resistance means to said collector-emitter circuit and to said second input for applying a voltage that is proportional to the average value of said emitter voltage to said second input.

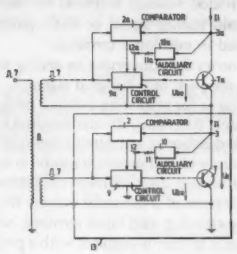
4,318,011
ARRANGEMENT INCLUDING A DELAYED-ACTION SEMICONDUCTOR SWITCH

Jürgen Zeis, Berlin, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 6, 1979, Ser. No. 100,997
Claims priority, application Fed. Rep. of Germany, Dec. 7, 1978, 2852943
Int. Cl.³ H03K 17/60
U.S. Cl. 307—300 14 Claims

1. In a circuit arrangement including at least one delayed-action semiconductor switch having a load current path leading through the switching path of said semiconductor switch and a control electrode connected via a control signal path to an input terminal for an input signal for switching said semiconductor switch between its conductive (switch-on phase) and blocking (blocking phase) states, and auxiliary circuit means, having a first control path extending from a tap in said load current path to a circuit point in said control signal path, for obtaining an actual value at said tap and for utilizing same to vary a control value fed to said control electrode during said switch-on phase to shorten the storage period of said semiconductor switch, i.e., the delay occurring during switching of said semiconductor switch from the conductive (switch-on phase) to the blocking (blocking phase) state; the improvement wherein said auxiliary circuit means includes:

comparator circuit means, connected in said first control path and having one input connected to said tap and a further input connected to said input terminal, for comparing the voltage at said tap with the voltage of the input



signal at said input terminal to provide an output signal responsive to the voltage at said tap during said storage period of said semiconductor switch;

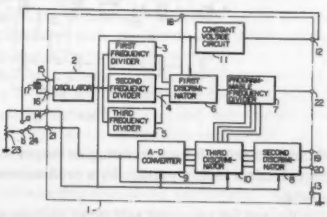
a memory connected to said comparator circuit means for storing a voltage value corresponding to said output signal; and

control circuit means, disposed in said control signal path and responsive to said input signal and to the voltage value stored in said memory, for regulating the control current supplied to said control electrode of said semiconductor switch during the next switch-on phase so as to maintain said storage period of said semiconductor switch substantially constant.

4,318,012
INPUT SIGNAL PROCESSING CIRCUIT FORMED AS AN INTEGRATED CIRCUIT

Hiroshi Minakuchi, Shiga, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 12, 1979, Ser. No. 47,950
Int. Cl.³ H03K 5/24
U.S. Cl. 307—360 8 Claims



1. An input signal processing circuit formed as an integrated circuit comprising:

a first power supply terminal for receiving a first potential,

a second power supply terminal for receiving a second potential lower than said first potential,

a divided voltage terminal receiving a divided voltage at a

level between the potential limits received by said first and second power supply terminals,

an input terminal for receiving an external command signal in the form of one of (1) an analog signal having a potential level varying in a level range between the potential level received by said divided voltage terminal and the potential level received by one of said power supply terminals and (2) a D.C. potential signal of a level substantially at the potential level received by the other one of said power supply terminals,

discriminator circuit means connected to said input terminal for determining whether a signal potential of said external command signal applied to said input terminal is at least higher or lower than a divided voltage potential received by said divided voltage terminal to thereby determine whether said analog signal or D.C. potential signal has been applied to said input terminal,

an A-D converter for converting an analog signal applied to said input terminal into a digital signal,

a program source for providing a digital program signal, and

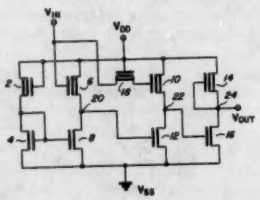
a programmable frequency divider adapted to be selectively programmed either by an output from said A-D converter or by an output of said program source in accordance with the output of said discriminator circuit means, such that upon application of a potential outside the level range of said analog signal to said input terminal, said programmable frequency divider is supplied with a program from said program source and upon application of a potential within the level range of said analog signal said programmable frequency divider is supplied with the output of said A-D converter.

4,318,013

HIGH VOLTAGE DETECTION CIRCUIT

James S. Thomas, Manor, and Kim Eckert, Austin, both of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 1, 1979, Ser. No. 35,042
Int. Cl.³ H03K *5/24, 17/30, 17/687*
U.S. Cl. 307—362 **10 Claims**



1. A detection circuit for generating an output when an input voltage exceeds a supply voltage by a predetermined amount, comprising:

an input stage for receiving said input voltage and said supply voltage, and for generating an enable signal when said input voltage exceeds said supply voltage; and

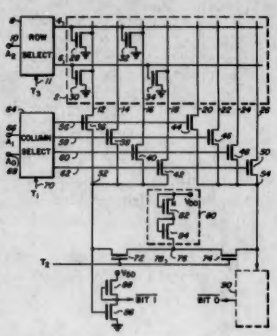
switching means coupled to said input stage, for receiving said input voltage, said supply voltage and said enable signal, and for providing said output in response to said enable signal when said input voltage exceeds said supply voltage by said predetermined amount.

4,318,014

SELECTIVE PRECHARGE CIRCUIT FOR READ-ONLY-MEMORY

Doyle V. McAlister, Pflugerville, and James R. Pfiester, Austin, both of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 27, 1979, Ser. No. 61,334
Int. Cl.³ H03K *19/096;* **G11C** *8/02*
U.S. Cl. 307—463 **7 Claims**



1. A selective precharge circuit comprising:

(a) a plurality of conductors;

(b) a common node;

(c) coupling means coupled to each of the conductors and to the common node for selectively coupling a selected one of said conductors to the common node when said coupling means is enabled;

(d) precharge means coupled to the common node for precharging only said selected conductor; and

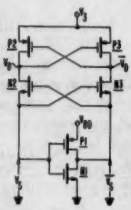
(e) a plurality of individually selectable discharge means coupled to each of the conductors, for selectively discharging said selected conductor.

4,318,015

LEVEL SHIFT CIRCUIT

Otto H. Schade, Jr., North Caldwell, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 29, 1979, Ser. No. 53,216
Int. Cl.³ H03K *19/003, 5/02, 3/356, 19/094*
U.S. Cl. 307—475 **9 Claims**



1. A level shift circuit comprising:

first and second transistors, each transistor having source and drain electrodes defining the ends of a conduction path, and a control electrode;

means for applying a driving signal having either a first value or a second value to the source electrode of said first transistor and to the control electrode of said second transistor, and means for applying the complement of said driving signal to the source electrode of said second transistor and to the control electrode of said first transistor for turning-on that one of said first and second transistors whose control electrode is at said second value and whose

source electrode is at said first value and turning off that one of said first and second transistors whose control electrode is at said first value and whose source electrode is at said second value; and

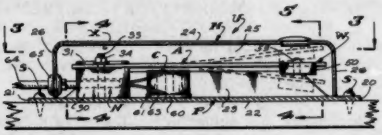
load means connected between the drain electrodes of each one of said first and second transistors and a power terminal to which is applied a voltage having a third value for producing a signal at the drain electrode of one of said first and second transistors which is approximately equal to said first value when that transistor is turned-on and which is approximately equal to said third value when that transistor is turned-off, where said second value is intermediate said first and third values.

4,318,016

TRANSDUCER

James P. McMullan, Huntington Beach; Albert Stevens, Garden Grove, and Kenneth J. Metzgar, Fullerton, all of Calif., assignors to Western Control Equipment Co., Garden Grove, Calif.

Filed Mar. 4, 1980, Ser. No. 127,111
Int. Cl.³ H02K *33/00*
U.S. Cl. 310—19 **10 Claims**



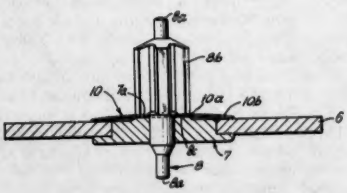
1. A transducer comprising an elongate frame with front and rear ends, support means projecting upwardly from the rear portion of the frame, an elongate longitudinally extending resilient armature with a rear end portion fixedly secured to and carried by the support means, said armature has a free front end portion terminating in vertical spaced relationship above the frame, weight means at and carried by the front end portion of the armature to increase the effective mass of and positioned to adjust the natural frequency of the armature, and an electro magnetic driver secured to the frame forward of the support means and having an upper end below the armature rearward of the weight means and defining a magnetic gap therebetween and power supply means delivering electric current to the driver at a frequency which is synchronistically tuned with the natural frequency of the armature.

4,318,017

ROTOR ASSEMBLY FOR ELECTRIC STEPPING MOTOR

Jean P. Migeon, Audeux, and Claude Poix, Besancon, both of France, assignors to Timex Corporation, Waterbury, Conn.

Filed Jan. 4, 1980, Ser. No. 109,595
Int. Cl.³ H02K *15/00*
U.S. Cl. 310—42 **4 Claims**



1. A rotor assembly useful for a stepping motor, comprising:

(a) a central shaft having a pinion thereon, the pinion having an end surface forming a first annular abutment surface projecting radially therefrom intermediate the shaft ends,

(b) a hub mounted on intermediate portions of said shaft and having a second annular abutment surface projecting radially therefrom in spaced, facing relationship to the first annular abutment surface of said shaft,

(c) an annular clamping washer having an inner peripheral portion clamped between the first and second abutment surfaces of said shaft and hub and having a resilient outer peripheral portion, and

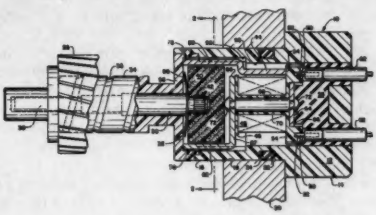
(d) an annular rotor disc having oppositely facing flat sides with one side located on the hub in a preselected axial position and the other side facing the clamping washer with the resilient outer peripheral portion of said washer bearing axially against said other side to clamp the rotor disc in preselected axial position on the hub.

4,318,018

ROTARY PULSE GENERATOR

Paul L. Kennedy, Meriden, Conn., assignor to Veeder Industries, Inc., Hartford, Conn.

Filed Apr. 21, 1980, Ser. No. 142,077
Int. Cl.³ H02K *21/12*
U.S. Cl. 310—156 **4 Claims**



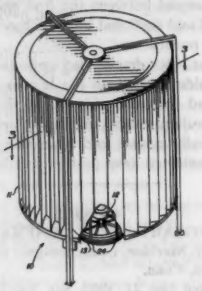
1. In a transmission mountable rotary pulse generator module useable in place of a conventional speedometer cable drive unit for generating a pulse for each predetermined increment of travel of an associated vehicle, comprising an elongated housing with a generally cylindrical inner sleeve section having an outer diameter less than one inch to be adapted to be mounted within a transmission housing bore, an inner drive shaft coaxially mounted on the inner sleeve section for being rotated by the transmission, and a pulse generator mounted within the housing and driven by the drive shaft for generating a train of pulses with a pulse for each predetermined increment of rotation of the drive shaft, the improvement wherein the pulse generator comprises a permanent magnet rotor, coaxially mounted on the drive shaft within the inner sleeve section, having an even plurality of generally equiangularly spaced magnetic poles of alternating polarity, and a physically integrated pickup coil subassembly mounted within the housing generally coaxially with the rotor and axially outwardly thereof and generally completely within the inner sleeve section, and having a coaxial annular coil mounted within the inner sleeve section and a stator core having a central core extending axially through the coil and two coaxial generally basket shaped pole pieces at opposite ends of the coil respectively, the two generally basket shaped pole pieces being integrally secured to the central core to provide said physically integrated subassembly and having alternating axially inwardly extending pole fingers respectively forming an annular arrangement of an even plurality of stator poles of alternating polarity within the inner sleeve section and adjacent the permanent magnet rotor for generating an AC coil output signal with the permanent magnet rotor, the inner sleeve section having an annular arrangement of axially extending slots receiving the pole fingers to accurately position the pole fingers adjacent to the permanent magnet rotor.

4,318,019

ALTERNATOR FOR WIND GENERATOR

Granvil E. Teasley, 1101 Elizabeth, and Allen V. Parker, 2040 Harvard, both of Barstow, Calif. 92311

Filed May 9, 1980, Ser. No. 148,407
Int. Cl.[3] H02K 21/12
U.S. Cl. 310—156 9 Claims



1. A machine for generating electricity comprising:
a pair of axially arranged spacedly positioned and fixedly mounted stators formed of non-conductive, non-magnetic material,
a rotor formed of conductive, non-magnetic material mounted for rotation between said stators in parallel relationship thereto;
each of said stators comprising a plurality of coils mounted thereon to extend around its periphery in a serpentine manner on a surface thereof facing said rotor,
said rotor being formed in the shape of a wheel provided with a rim of a predetermined width and defining a plurality of openings spacedly positioned around its periphery within said rim,
the width of the portion of said rim extending radially outward of said openings in said rotor being greater than the width of the portion of said rim extending radially inward of said openings,
a plurality of permanent magnet means one mounted within each of said openings,
said magnet means being arranged in sequence around said rim such that polarization of adjacent magnet means cause a field reversal in said coils as said rotor is rotated between said stators in magnetic proximity thereto,
said predetermined width being of a size sufficient such that eddy currents induced therein produce a magnetic field that aids rotation of said rotor.

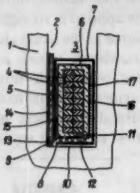
4,318,020

WINDING OF AN ELECTRIC MACHINE

Hartmut Meyer, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 852,192, Nov. 17, 1977, abandoned.
This application Oct. 5, 1979, Ser. No. 82,169
Claims priority, application Fed. Rep. of Germany, Dec. 6, 1976, 2655609
Int. Cl.[3] H02K 3/34
U.S. Cl. 310—215 3 Claims

1. In an electric machine having a slot for receiving a winding, an insulated winding bar in said slot and having an outer glow discharge protection layer, an electrically conductive lining means between the winding bar and the slot, and an electrically conductive shim for securing the bar in the slot, the winding bar having a narrow side facing the bottom of the slot, the improvement comprising:
the lining means including a protective strip of conductive material placed on the glow discharge protection layer, the width of the strip being substantially equal to the circumference of the winding bar and the length of the strip being substantially equal to the length of the slot, one edge of the strip being cemented with conductive adhesive to the narrow side of the bar facing the slot so as to lie along and adjacent to a corner of the bar, and the remainder of the width of the strip being wrapped around the bar



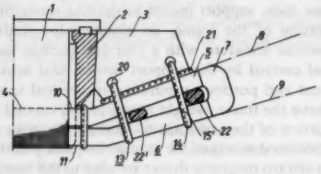
to approach the corner from the other side, leaving the opposite edge of the strip free; and
the shim being inserted between the free edge of the conductive strip and the slot to pull the free edge towards the corner of the bar on the bottom of the slot.

4,318,021

ROTARY AC MACHINE STATOR WITH PRESSURE HOSE SUPPORTED COIL ENDS

Sven Johansson; Roland Kolsmyr; Kristian D. Madsen, and Esko Polvi, all of Vesteras, Sweden, assignors to ASEA Aktiebolag, Vesteras, Sweden

Filed Dec. 3, 1979, Ser. No. 99,393
Claims priority, application Sweden, Dec. 8, 1978, 7812632
Int. Cl.[3] H02K 3/46
U.S. Cl. 310—260 7 Claims



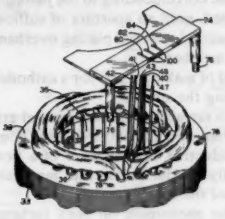
1. In a stator rotary AC machine of the type including a stator core having two press rings and winding slots in which a stator winding composed of coils is arranged, each coil comprising a straight bottom portion lying at the bottom of a winding slot as well as a straight top portion lying at the top of another slot, said straight portions being connected to each other at a stator end by means of a coil end comprising a bottom coil end half and a top coil end half connected in series with each other by means of a connecting loop, all the coil end halves being positioned between first and second imaginary rotational surfaces, and rotational surfaces coinciding with coil end surfaces along the entire axial coil end extension and being coaxial with the stator core, and at least one flexible pressure hose being pressure filled with curable resin to provide support for the coil ends, the improvement that in the space between said first and second rotational surfaces said flexible pressure hose comprises a plurality of first substantially straight hose portions which extend radially in relation to said stator core and are distributed along the circumference of said stator winding, a plurality of U-shaped second hose portions connected with said plurality of first hose portions and opened radially outwardly, and a plurality of U-shaped third hose portions connected with said plurality of first hose portions and opened radially inwardly, so that said flexible pressure hose forms a zig-zag configuration, a plurality of said second and/or third U-shaped hose portions being each arranged with its concave side in mechanical contact with at least one coil side.

4,318,022

END TURN AND TERMINAL SUPPORT FOR A STATOR ASSEMBLY

Sammy L. Miller, Bowling Green, Ky., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 844,915, Oct. 25, 1977, Pat. No. 4,215,464.
This application Apr. 16, 1980, Ser. No. 140,760
Int. Cl.³ H02K 3/46
U.S. Cl. 310—260 3 Claims



1. A dynamoelectric machine stator assembly comprising: a magnetic core having an outer periphery, a bore, and longitudinally extending slots that extend radially from the bore to closed ends proximate to the outer periphery of the core; at least one winding having side turn portions thereof disposed within the core slots and end turn portions thereof disposed about at least one core face; portions of some of said end turns being in a compressed and shaped condition so as to establish a flattened region defining a predetermined space unoccupied by said end turns; the at least one winding having at least two tap wires extending from the end turn portions to a common connecting region near said flattened region; at least two lead wires each connected to at least one respective tap wire thereby establishing respective connection points; a connection insulator formed from at least one piece of sheet material electrical insulating material and having a sheet material base portion deformed into conformity with the windings and having a plurality of holsters, said connection insulator being disposed in the predetermined space adjacent the outer periphery of the end turn portions at the common connecting region adjacent to said flattened region, with said sheet material base portion conformed in shape to the contour of the end turn portions; said connection points being disposed within respective holsters of the connection insulator; and said connection insulator being retained in position on the outer periphery of the end turn portions and located radially with respect to the core between the outer periphery of the core and the closed ends of the slots.

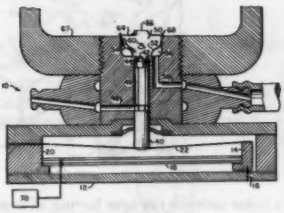
4,318,023

SAGITTALLY AMPLIFIED PIEZOELECTRIC ACTUATOR

Cormac G. O'Neill, Walnut Creek, and Parker C. Smiley, Oakland, both of Calif., assignors to Physics International Company, San Leandro, Calif.

Filed Feb. 21, 1980, Ser. No. 123,215
Int. Cl.³ H01L 41/08
U.S. Cl. 310—328 3 Claims

1. An electroexpansive actuator comprising
a sagittal tension member having a first end and a second end comprising an elongated resilient strap deformed proximate its midpoint to cause said ends extending longitudinally from each side of said midpoint to define an obtuse angle,
an electroexpansive member having a first end and a second end adapted to exert a tensile force in said sagittal tension member coincident with the longitudinal axis of said sagittal tension member,
means for connecting said first end of said electroexpansive member to said first end of said sagittal tension member, said means comprising
a fixed support member,
a lever arm support member having first and second ends,
means for connecting said first end of said sagittal tension member to said first end of said lever arm member, and
means for hingedly connecting said second end of said lever arm member to said fixed support member, said means comprising



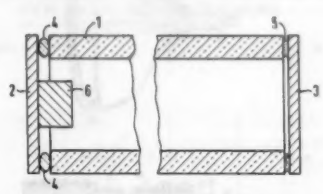
at least one wire having one end attached to said second end of said lever arm and the other end of said wire connected to said fixed support member,
means for connecting said second end of said electroexpansive member to said second end of said sagittal tension member,
means for applying a voltage to said electroexpansive member for varying the dimensions thereof, and
means for operating a device connected proximate the midpoint of said sagittal tension member.

4,318,024

FLASH TUBE

Werner Rech, Taunusstein; Wolfgang Welsch, Wiesbaden, and Josef Zimlich, Taunusstein, all of Fed. Rep. of Germany, assignors to Heimann GmbH, Fed. Rep. of Germany

Filed Oct. 29, 1979, Ser. No. 89,618
Claims priority, application Fed. Rep. of Germany, Nov. 10, 1978, 2848891
Int. Cl.³ H01J 17/16
U.S. Cl. 313—220 12 Claims



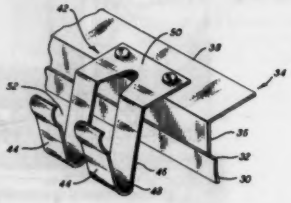
12. A flash tube comprising: a hollow cylindrical tube comprised of an element selected from the group consisting of hard glass and quartz; solid metallic sheet metal end caps attached to each end of the tube in a gas-tight connection and which support and act as electrical connection leads to electrodes in the tube interior located directly at an inner surface of each of the end caps; a gas filling in the tube; the gas tight connection of the end caps with the tube ends each comprising a ring of organic adhesive between the end cap and an end surface of the tube; a cathode in the shape of a sintered body attached and located directly at an inner side of one end cap; the sintered body having a metallic grid structure and containing a getter metal as a means for reducing a work function of electrons at the cathode; and the sintered body having a diameter smaller than the internal diameter of the tube.

4,318,025

SHADOW MASK MICROPHONIC SUPPRESSOR

Carl W. Penird, Waterloo, and Richard A. Tamburrino, Auburn, both of N.Y., assignors to North American Philips Consumer Electronics Corp., New York, N.Y.

Filed Nov. 21, 1979, Ser. No. 96,359
Int. Cl.³ H01J *29/07*
U.S. Cl. 313—404 **1 Claim**



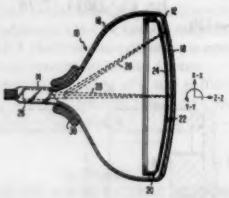
1. In a color cathode ray tube having an evacuated envelope with a face plate and sidewalls and including a shadow mask mounted adjacent said face plate and supported by springs from said sidewalls, said shadow mask having a frame including an inwardly directed flange, the improvement comprising: at least one substantially U-shaped microphonic suppressor having two separated legs connected by a bite, one of said legs being provided with a mask attachment flange, said flange fixedly attached to said mask flange, said bite extending toward said face plate, and the other of said legs projecting into a space between the mask and the sidewall and firmly contacting the sidewall, at least the sidewall-contacting leg being bifurcated.

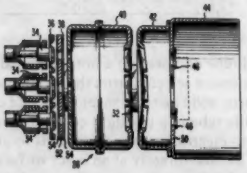
4,318,026

METHOD OF MAKING A GRID FOR A CATHODE-RAY TUBE ELECTRON GUN

Ralph J. D'Amato, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y. .

Filed Apr. 30, 1980, Ser. No. 145,237
Int. Cl.³ G03C *5/00*; H01J *29/46*
U.S. Cl. 313—448 **3 Claims**





1. A method of making a grid for a cathode-ray tube electron gun, comprising the steps of

coating both sides of an electrically conductive base member of a first material with a photoresist,

exposing the photoresist on both sides of said base member through two related photomasters, each photomaster having a pattern including at least one element corresponding to an intended aperture to be formed in the grid,

removing all portions of the photoresist except the portions corresponding to the pattern element locations,

plating the portions of the base member where the photoresist has been removed with an electrically conductive second material,

removing the portions of the photoresist corresponding to the pattern element locations,

simultaneously etching the base member from both sides through openings in the second material plating where the photoresist corresponding to the pattern element locations was located, until an aperture of sufficient size is formed that the second material plating overhangs the aperture in the base member.

2. A method of making a grid for a cathode-ray tube electron gun, comprising the steps of

coating both surfaces of an unapertured grid with a photoresist wherein said unapertured grid comprises an electrically conductive base member of a first material and an electrically conductive second material laminated to the surfaces of the base material,

exposing the photoresist on both surfaces of said unapertured grid through two related photomasters, each photomaster having a pattern including at least one element corresponding to an intended aperture to be formed in the grid,

removing only the portions of the photoresist corresponding to pattern element locations,

simultaneously etching the laminated second layer through openings in the photoresist formed when portions of the photoresist are removed, to the base member,

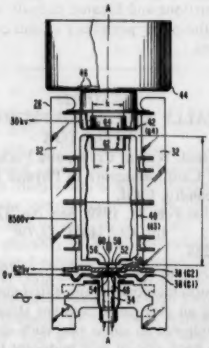
simultaneously etching the base member from both sides through etched openings in the laminated second material until an aperture of sufficient size is formed that the laminated second material overhangs the aperture in the base member.

4,318,027

HIGH POTENTIAL, LOW MAGNIFICATION ELECTRON GUN

Richard H. Hughes, Lancaster, and Hsing-Yao Chen, Landisville, both of Pa., assignors to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 895,588, Apr. 12, 1978, abandoned. This application Sep. 24, 1979, Ser. No. 78,134
Int. Cl.³ H01J *29/46, 29/56*
U.S. Cl. 315—15 **22 Claims**



1. An electron gun comprising in spaced relation, in the order named, a cathode, an apertured plate control grid (G1), an apertured plate screen grid (G2), a tubular first lens electrode (G3), and a second lens electrode (G4), wherein:

(a) said G2 has a thickness of 0.4–1.0 times the diameter of the G2 aperture, and

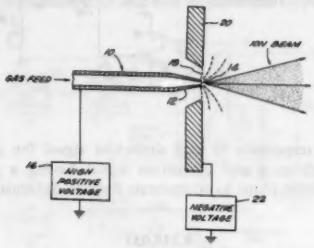
(b) said G3 has a length of 2.5–5.0 times the G3 lens diameter.

4,318,028

ION GENERATOR

Julius Perel, Altadena, and John F. Mahoney, Pasadena, both of Calif., assignors to Phrasor Scientific, Inc., Duarte, Calif.

Filed Jul. 20, 1979, Ser. No. 59,240
Int. Cl.[3] H01J 27/02, 20/02
U.S. Cl. 315—111.81 16 Claims



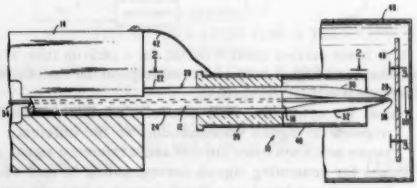
1. An improved apparatus for generating a high intensity ion beam, comprising:
- a nozzle having an inlet end adapted to communicate with a source of a species to be ionized, an outlet end, and a passage extending therethrough and terminating in a relatively small orifice at said outlet end; and
- means for generating an electrostatic field at said outlet end of said nozzle of sufficiently high intensity to produce a high intensity ion beam caused by collisions of electrons with atoms of the species.

4,318,029

LIQUID METAL ION SOURCE

Jerg B. Jergenson, Santa Barbara, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed May 12, 1980, Ser. No. 148,851
Int. Cl.[3] H01J 27/02
U.S. Cl. 315—111.81 11 Claims



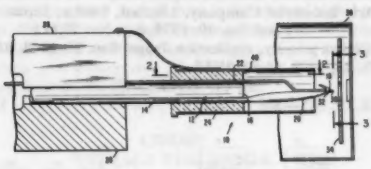
1. A liquid metal ion source comprising:
- a tubular body of electrical insulation material, said body having a face and having an opening therethrough from said face;
- a strip heater having a folded apex and having first and second legs extending from said apex, said legs being engaged on said tubular body so that said apex is positioned beyond said face, an opening in said strip heater at said apex, said strip heater being made of metallic material and being connectable to a heater electric power supply for electrically heating said strip heater at said apex by current through said strip heater legs,
- a metallic needle positioned in said opening through said body and extending beyond said face and extending through said opening in said apex of said strip heater, said needle having a pointed needle tip positioned beyond said apex of said strip heater and against said needle so that liquid metal flows out to said needle point so that ions can be emitted at said needle point from the liquid metal.

4,318,030

LIQUID METAL ION SOURCE

Jerg B. Jergenson, Santa Barbara, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed May 12, 1980, Ser. No. 148,852
Int. Cl.[3] H01J 27/02
U.S. Cl. 315—111.81 12 Claims



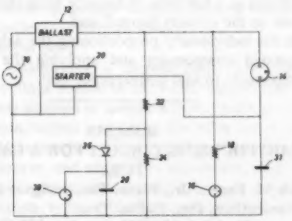
1. A liquid metal ion source comprising:
- a body of electrical insulation material, said body having a face;
- a strip heater having a folded apex and having a first leg extending from said apex, said leg being engaged on said body so that said apex is positioned beyond said face, an opening in said strip heater at said apex, said strip heater being made of metallic material;
- a metallic needle positioned with respect to said body and extending beyond said face and extending through said opening in said apex, said needle being in contact with said strip heater, said needle having a pointed needle tip positioned beyond said apex, said first leg and said needle being connectable to a heater electric power supply for electrically heating said strip heater at said apex by current through said strip heater leg and said needle so that metal can be melted within said apex of said strip heater and against said needle so that liquid metal flows out to said needle point so that ions can be emitted at said needle point from the liquid metal.

4,318,031

LAMP, BALLAST AND STARTER VISUAL MONITOR

Wayne F. Lonseth, Austin, and William C. Dirk-Hazen, Kyle, both of Tex., assignors to Esquire, Inc., New York, N.Y.

Filed Oct. 31, 1979, Ser. No. 89,852
Int. Cl.[3] H05B 41/18
U.S. Cl. 315—133 6 Claims



1. In combination with a light fixture including a lamp, a ballast connected to the lamp and a starter connected to the lamp for providing voltage pulses thereto, a visual monitor including
- an indicator light circuit connected to the starter having
  - a storage capacitor,
  - a diode connected to said capacitor and conductive at a predetermined voltage, and
- an indicator light connected to said capacitor,

wherein when the lamp is not lit, a properly operating starter producing pulses of short duration of predetermined amplitude causes conduction of said diode and storage on said capacitor, a plurality of pulses causing capacitor discharge through said indicator to cause a periodic blinking thereof, the absence of periodic light blinking indicating a starter failure.

4,318,032

CONVERGENCE CIRCUIT INCLUDING A QUADRANT SEPARATOR

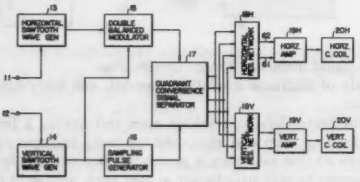
Takeshi Kureha, Kadoma, Japan, assignor to Matsushita Electric Industrial Company, Limited, Osaka, Japan

Filed Sep. 19, 1979, Ser. No. 77,112

Claims priority, application Japan, Sep. 25, 1978, 53-118345; Feb. 16, 1979, 54-19104[U]

Int. Cl.³ H01J *29/70, 29/76*

U.S. Cl. 315—368 **11 Claims**



1. A convergence circuit for use in a television receiver having horizontal and vertical deflection systems for scanning a cathode ray beam to generate a rectangular raster on a cathode ray tube screen and at least one convergence coil for correcting the path of said beam, comprising:

a first generator for generating a first signal of time-varying amplitude at a frequency synchronized with said horizontal deflection system;

a second generator for generating a second signal of time-varying amplitude at a frequency synchronized with said vertical deflection system;

a balanced modulator for modulating said first signal with said second signal to generate a modulated signal of a waveform symmetrical with respect to a point corresponding to the center of said raster;

means for separating the waveform of said modulated signal into four components whose envelopes are symmetrical to said point so that the first signal contained in said separated components occurs in the respective quadrants of said raster in synchronism with the scanned cathode ray beam and the instantaneous amplitude of said components increases as a function of distance from the center of said raster to the corners thereof; and

means for individually proportioning the amplitude of said separated components and applying the proportioned components to said convergence coil.

4,318,033

DYNAMIC FOCUSING CIRCUIT FOR A CATHODE RAY TUBE

Frederick M. Eames, Jr., Plano, Tex., assignor to Harris Data Communications, Inc., Dallas, Tex.

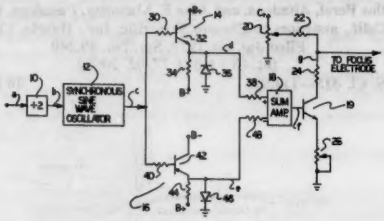
Filed Jul. 30, 1980, Ser. No. 173,725

Int. Cl.³ H01J *29/58*

U.S. Cl. 315—382 **10 Claims**

1. A dynamic focusing circuit for a cathode ray tube having means for deflecting the cathode ray beam along first and second mutually perpendicular axes, and focusing means for normally receiving a steady state DC focusing signal for focusing said beam as it is scanned along said respective axes, nonresonant focus correction means for supplying a correction signal to said focusing means to compensate for defocusing characteristics of said focusing means in response to said steady state DC signal, said nonresonant focus correction means including:

means for providing a sinusoidal signal having a frequency one-half that of the scan frequency for one of said axes, and



means responsive to said sinusoidal signal for providing therefrom a said correction signal having a generally parabolic shape to compensate for said defocusing.

4,318,034

BEAM CURRENT CONTROL CIRCUIT

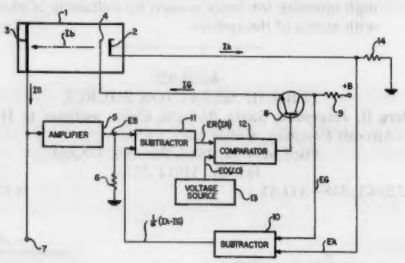
Takashi Nakamura, Hatano, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 15, 1980, Ser. No. 178,385

Claims priority, application Japan, Aug. 16, 1979, 54-104225

Int. Cl.³ H01J *29/52*

U.S. Cl. 315—383 **3 Claims**



1. A beam current control circuit for a pick-up tube which operates with higher control electrode potential than cathode electrode potential, comprising:

means for controlling said control electrode potential in response to signals corresponding to the difference between an excess beam current and a reference signal, and

means for generating signals corresponding to said excess beam current based on a signal current, a cathode current and a control electrode current of said pick-up tube.

4,318,035

SIDE PINCUSHION CORRECTION CIRCUIT

William V. Fitzgerald, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 8, 1980, Ser. No. 119,963

Int. Cl.³ H01J *29/70*

U.S. Cl. 315—387 **6 Claims**

1. In a television receiver including a deflection yoke having horizontal deflection windings and vertical deflection windings, said vertical deflection windings having a high potential terminal and a low potential terminal; means for supplying line rate sawtooth current waves to said horizontal deflection windings; and a saturable reactor having an input winding and presenting an impedance to said supplying means which is

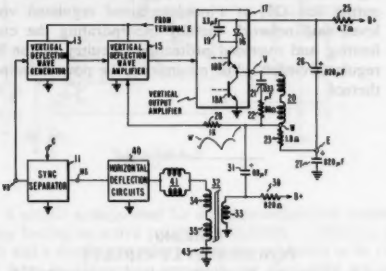
subject to variation in accordance with variations in current flow in said input winding; apparatus comprising:

a vertical deflection wave generator;

means, responsive to field rate deflection waves developed by said generator for energizing said vertical deflection windings with a field rate deflection current of substantially sawtooth waveshape; said energizing means including;

(1) a first amplifier having first and second inputs and an output, said first input receiving said field rate deflection waves developed by said generator; and

(2) a deflection wave output amplifier having an input terminal coupled to receive amplified deflection waves appearing in said output of said first amplifier, an output terminal



coupled to said high potential terminal of said vertical deflection windings, and a common terminal coupled to said low potential terminal of said vertical deflection windings by a current path consisting of the series combination of only a resistor and a capacitor across which appears a composite voltage corresponding to the sum of a field rate sawtooth voltage wave component and a field rate parabolic voltage wave component;

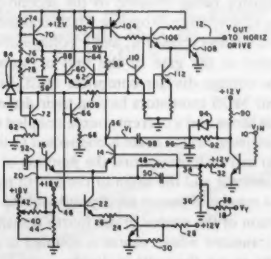
a feedback path coupled between said low potential terminal of said vertical deflection windings and said first amplifier for applying said composite voltage to said second input of said first amplifier; and

means for utilizing said composite voltage developed across said series combination to control the flow of current in said input winding.

4,318,036
PULSE WIDTH MODULATOR FOR A TELEVISION RECEIVER

Stan Bart, Hoffman Estates, and Gopal K. Srivastava, Buffalo Grove, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Nov. 10, 1980, Ser. No. 205,819
Int. Cl.³ H01J *29/70, 29/76*
U.S. Cl. 315—408 **13 Claims**



1. In a television receiver having a source of horizontal rate pulses, a pulse width modulator for varying the width of the horizontal rate pulses, a horizontal drive system for deflecting the receiver's electron beam in response to the width-modulated pulses, and a high voltage generator powered by the horizontal drive system, an improved pulse width modulator comprising:

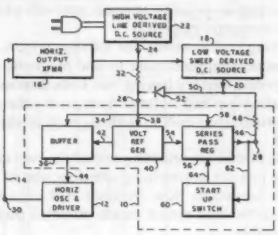
first means sensing the receiver's electron beam current and the amplitude of its high voltage for developing a control signal which varies in response to variations in the amplitude of the high voltage and the beam current; and

second means receiving the control signal and the horizontal rate pulses for developing output pulses whose widths are varied in response to variations in the control signal such that the width-modulated pulses cause the horizontal drive system to develop a substantially constant horizontal picture size irrespective of variations in the receiver's beam current or high voltage.

4,318,037
VOLTAGE REGULATOR

David Amaro, Kansas City, Mo., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Nov. 21, 1980, Ser. No. 209,164
Int. Cl.³ H01J *29/70*
U.S. Cl. 315—411 **10 Claims**



1. In a television receiver having a powerline source, a horizontal oscillator for exciting a horizontal sweep system, and a voltage source derived from the excited sweep system, a voltage regulator for energizing the horizontal oscillator and for developing a regulated D.C. voltage for use in the receiver, comprising:

an input adapted to receive current from the power-line source;

means responsive to current received at said input port for initially energizing the horizontal oscillator such that the horizontal sweep system becomes excited for energizing the sweep-derived voltage source;

an input/output port;

means for establishing a current path from the sweep-derived voltage source to the input/output port;

switch means adapted to assume a first condition responsive to the input/output port being driven to less than a minimum voltage level by the current from the sweep-derived voltage source, and adapted to assume a second condition responsive to the input/output port being driven to at least the minimum voltage by the current from the sweep-derived voltage source; and

regulator means responsive to the switch means being in its second condition for coupling current from the input port to the input/output port such that the latter port is held at a regulated voltage level while current from the sweep-derived voltage is also received at the input/output port via the current path,

whereby the horizontal oscillator is energized for exciting the horizontal sweep system, and a regulated voltage for supplying current derived from both the input port and

the current path is thereafter available at the input/output port.

4,318,038

MOVING-COIL LINEAR MOTOR

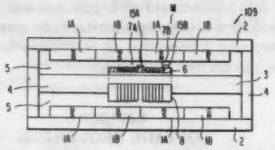
Hidehiko Munehiro, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Nov. 13, 1979, Ser. No. 93,556

Claims priority, application Japan, Nov. 15, 1978, 53-140653; Nov. 15, 1978, 53-140654; Feb. 2, 1979, 54-11221

Int. Cl.³ H02K *33/00*

U.S. Cl. 318—135 **7 Claims**



1. A moving-coil linear motor, comprising:

a magnetic circuit means for providing a plurality of magnetic fields at an air gap, wherein said magnetic fields alternate in polarity at equal intervals along the length of the magnetic circuit;

a moving coil assembly for moving within said air gap in a direction perpendicular to said magnetic fields, said moving coil assembly having two coils disposed in side-by-side relationship and isolated from each other, each coil being approximately half as wide as each of the magnetic poles; and

a logic circuit for selecting one of the two coils for energization and for determining the direction of the electric current caused to flow through said coils in response to a magnetic field sensor means mounted on said moving coil assembly.

4,318,039

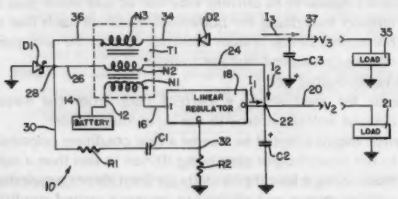
SWITCHING POWER SUPPLY REGULATOR UTILIZING LINEAR REGULATOR DEVICE

Warwick R. Abbott, Woburn, Mass., assignor to The Nixdorf Computer Corporation, Burlington, Mass.

Filed Jan. 10, 1980, Ser. No. 110,869

Int. Cl.³ G05F *1/44*

U.S. Cl. 323—273 **12 Claims**



1. A voltage regulator network (**10**) for use in cooperation with a linear voltage regulator circuit (**18**) having an input line (I), an output line (O), and a common line (C) connected thereto, said linear regulator circuit (**18**) being operative to generate a regulated voltage level between said output line (O) and said common line (C) while providing internal current limiting and thermal overload protection circuitry, said network comprising:

a potential source (**14**);

a transformer (T1) having at least first (N1) and second (N2) windings of corresponding polarities magnetically coupled together, the first winding (N1) having an input (**12**) coupled to the potential source (**14**) and an output (**16**) coupled to the input (I) of the linear regulator circuit (**18**);

an output line (**20**) for the network (**10**) coupled to the output line (O) of the linear regulator circuit (**18**);

first capacitor means (C2) coupled in parallel between the network output line (**20**) and a load (**21**) to be regulated;

said second winding (N2) having an output (**24**) coupled to the output line (**20**) of the network;

whereby said linear regulator circuit (**18**) is switched on and off in a cyclical manner depending upon the voltage level of said first capacitor (C2), with said regulator circuit (**18**) and second transformer winding (N2) alternately providing current to said capacitor (C2) to maintain the network output line (**20**) at a predetermined regulated voltage level, said network thereby incorporating the current limiting and overload protection circuitry of the linear regulator circuit while minimizing the power dissipation thereof.

4,318,040

POWER SUPPLY CIRCUIT

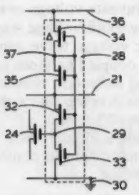
Robert A. Hilbourne, Eastleigh, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 5, 1979, Ser. No. 90,969

Claims priority, application United Kingdom, Nov. 14, 1978, 44330/78

Int. Cl.³ G05F *3/02*

U.S. Cl. 323—312 **12 Claims**

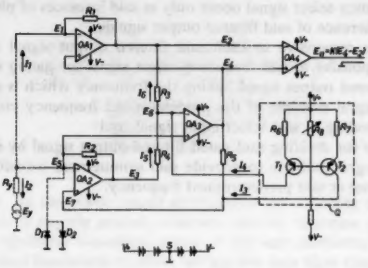


1. A power supply circuit comprising a first, input supply rail, a second, output power supply rail, a depletion MOS transistor having its source-drain path connected between the first power supply rail and the second power supply rail, a long tail pair amplifier for comparing a signal indicative of the voltage on the second power supply rail with a reference voltage signal, the amplifier comprising first and second enhancement MOS transistors, the drain of the first transistor being coupled to the second power supply rail, the drain of the second transistor being coupled to the second power supply rail by way of a voltage dropping MOS transistor and to the gate of the depletion transistor, and a voltage divider having a tap connected to the gate of the first or second transistor, wherein the voltage divider comprises third, fourth and fifth enhancement MOS transistors having their drain-source paths connected in series and a current source coupled to the drain of the third transistor, which drain is connected to the gates of the third, fourth and fifth transistors, the junction of the source of the third transistor and the drain of the fourth transistor being coupled to a regulated power supply and said tap being formed by the junction of the source of the fourth transistor and drain of the fifth transistor whose source is coupled to a third supply rail, whereby in use the voltage divider ratio is held substantially constant due to the third transistor compensating for the effects of process variations on threshold voltage.

4,318,041
CIRCUIT ARRANGEMENT FOR AN ELECTRO-CHEMICAL MEASURING DEVICE

George E. Fredericks, Graz, Austria, assignor to AVL AG, Schaffhausen, Switzerland

Filed Aug. 6, 1979, Ser. No. 64,266
Claims priority, application Austria, Aug. 21, 1978, 6084/78
Int. Cl.[3] G01N 27/00
U.S. Cl. 324—71 R 6 Claims



1. A circuit arrangement for an electro-chemical measuring device having an active polarized electrode, a reference electrode and a diaphragm which separates a solution to be examined from an electrolyte in which the electrodes are to be immersed, which comprises:

(i) first and second operational amplifiers which serve as current-voltage converters and each of which is provided with an inverting input and a non-inverting input;

(ii) means connecting said electrodes respectively to the inverting inputs of said first and second operational amplifiers;

(iii) a third operational amplifier provided with an inverting input and a non-inverting input;

(iv) means connecting the non-inverting input of said third operational amplifier to the inverting input of said second operational amplifier;

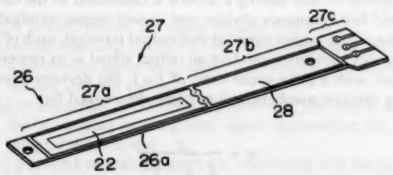
(v) means connecting the output of said third operational amplifier to the non-inverting inputs of said first and second operational amplifiers; and

(vi) a voltage divider connected across the outputs of said first and second operational amplifiers, said voltage divider comprising at least two serially-connected resistors having a common junction which is connected to the inverting input of said third operational amplifier, whereby said third operational amplifier determines the prevailing current difference in the electrode currents for initiating any necessary correction.

4,318,042
ELECTROMETER PROBE

Tadahiro Eda; Susumu Tatsumi, and Chikara Imai, all of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Feb. 11, 1980, Ser. No. 120,581
Claims priority, application Japan, Feb. 28, 1979, 54-22689
Int. Cl.[3] G01R 31/02
U.S. Cl. 324—72.5 17 Claims



1. An electrometer probe comprising a substrate, a detecting electrode provided on the substrate and a guard electrode provided on the substrate, the substrate being formed of a material such that an electrical resistance between the detecting electrode and the guard electrode is at least 10^9 ohms;

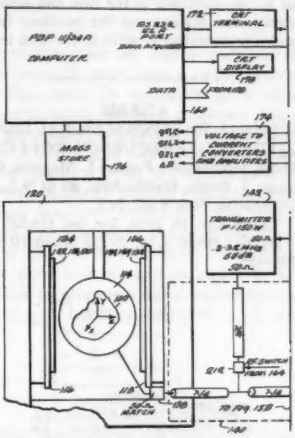
said material comprising resin;

the resin comprising a reactive high molecular substance and a cyanate radical.

4,318,043
METHOD AND APPARATUS FOR RAPID NMR IMAGING OF NUCLEAR DENSITIES WITHIN AN OBJECT

Lawrence E. Crooks, Richmond; John C. Hoenninger, III, Berkeley, and Mitsuaki Arakawa, San Mateo, all of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Continuation-in-part of Ser. No. 926,571, Jul. 20, 1978. This application Feb. 12, 1980, Ser. No. 120,875
Int. Cl.[3] G01N 27/00
U.S. Cl. 324—309 65 Claims



1. In a method for generating a detectable signal related to the relative densities of nuclei within an object, the method comprising the steps of selectively exciting a predetermined volume by exciting intersecting regions within said object to generate an NMR response, said predetermined volume defined by the intersection of said regions, and repeating said exciting step at least once, the improvement wherein said repeating step further comprises:

repeating said exciting step for further regions defining further predetermined volumes outside of previously excited regions, the last region excitation occurring within the spin-lattice relaxation time of the first predetermined volume excitation.

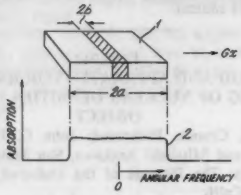
4,318,044
METHODS OF INDICATING NUCLEAR SPIN DENSITY DISTRIBUTION

Peter Mansfield, Nottingham, England, assignor to National Research Development Corporation, London, England

Filed Feb. 29, 1980, Ser. No. 126,016
Claims priority, application United Kingdom, Mar. 7, 1979, 08040/79
Int. Cl.[3] G01N 27/00
U.S. Cl. 324—309 4 Claims

1. A method of indicating the spin density distribution in a sample of material containing nuclear spins comprising the steps of subjecting a sample to a static magnetic field along one axis, applying a first magnetic field gradient to said static mag-

netic field and a 90° radio frequency field to excite spins to select a strip in the sample, switching off the said first magnetic field gradient, applying a second magnetic field gradient to said static magnetic field which varies in one direction normal to the plane of a desired slice in the selected strip for a time which is limited so that the free induction decay signal does not



reach an initial zero value, and then replacing the said second magnetic field gradient by a third magnetic field gradient to said static magnetic field which varies in a direction mutually orthogonal to the direction of the first and second magnetic field gradients, and reading out the resultant free induction decay signal representative of spins in the slice in the selected strip.

4,318,045

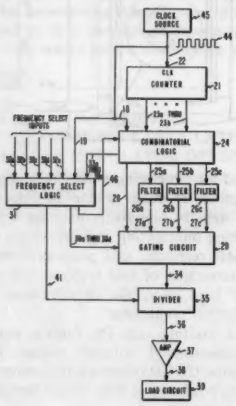
SYMMETRICAL WAVEFORM SIGNAL GENERATOR HAVING COHERENT FREQUENCY SHIFT CAPABILITY

John E. Krupa, Moorestown; Preston L. Magness, Cinnaminson, and Thomas J. Brady, Haddonfield, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Apr. 10, 1980, Ser. No. 138,867

Int. Cl.³ H03K *3/84, 29/00;* **H03B** *19/00*

U.S. Cl. 328—18 **7 Claims**



1. An apparatus for providing in response to a clocking signal one of a plurality of symmetrical waveform signals at predetermined different frequencies selectable according to corresponding select input signals, said apparatus comprising:

counter means responsive to said clocking signal for producing a plurality of counter output signals having frequencies which are integral divisors of said clocking signal;

combinatorial means coupled to said counter means for combining said counter output signals in a manner to produce combinatorial output signals of a given integral multiple of said predetermined frequencies;

means including separate filters tuned to said integral multiple of said predetermined frequencies responsive to each of said combinatorial output signals for producing substantially symmetrical filtered output signals at said integral multiple of said predetermined frequencies and for aligning all of said filtered output signals in a manner to produce periodic instances of phase coherence of said filtered output signals;

said combinatorial means including means for producing timing signals related to said periodic instances of phase coherence;

switch means responsive to a selected one of said select input signals and responsive to said timing signal for producing a frequency select signal, whereby changes in said frequency select signal occur only at said instances of phase coherence of said filtered output signals;

means responsive to each said filtered output signal and responsive to said frequency select signal for gating said filtered output signal having the frequency which is said integral multiple of the predetermined frequency corresponding to said select input signal; and

means for dividing said gated filtered output signal by said integral multiple to provide said symmetrical waveform signal at said predetermined frequency.

4,318,046

DIGITAL FREQUENCY DIVIDER

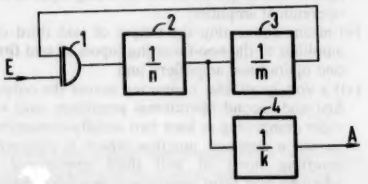
Fritz Sonntag, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Oct. 18, 1979, Ser. No. 86,156

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1978, 2849797

Int. Cl.³ H03K *21/00*

U.S. Cl. 328—39 **6 Claims**



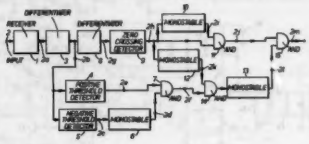
1. A digital frequency divider for dividing an input frequency to produce an output frequency at an output terminal related to the input frequency by the fraction less than unity Z/N; comprising an exclusive-OR gate having one input connected to receive a signal at said input frequency, a first frequency divider having a divisor n connected to the output of said exclusive-OR gate, a second frequency divider having a divisor m connected to the output of said first frequency divider, the output of said second frequency divider being connected to a second input of said exclusive-OR gate, and a third frequency divider having a divisor k connected to the output of said first frequency divider and to said output terminal for producing an output signal at said output terminal, each of said frequency dividers providing an output signal at its respective output with a pulse-space ratio of 1=1, the divisors n and k being integral numbers, and m being determined by:

$$m = \frac{Z}{Z \cdot n - \frac{N}{k}}$$

4,318,047
DETECTION OF NARROW PULSES

John H. Dawson, Chelmsford, England, assignor to The Marconi Company Limited, Chelmsford, England

Filed May 2, 1979, Ser. No. 35,402
Claims priority, application United Kingdom, May 30, 1978, 23752/78
Int. Cl.³ G01R *29/02;* G01S *3/78*
U.S. Cl. 328—112 10 Claims



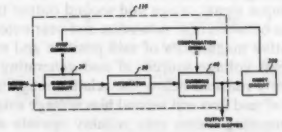
1. An electronic circuit arrangement for detecting the presence of sharply peaked, relatively narrow, Gaussian pulses in an electrical waveform signal of the sort emanating from a limited bandwidth receiver having low pass filter characteristics, which arrangement comprises: differentiator means connected to said electrical waveform signal for producing the first and the second differentials, with respect to time, of said electrical waveform signal; pulse curvature discriminating means responsive to said first differential of the electrical waveform signal for discrimination against pulses in the waveform having a curvature less sharp than that sharp peak curvature characteristic of a desired pulse; pulse width discriminating means responsive to said second differential of the electrical waveform signal for discriminating against pulses in the waveform having a width greater than that width characteristic of a desired pulse; and pulse symmetry discriminating means responsive to said pulse curvature discriminating means and to said second differential for discriminating against pulses in the waveform which are not roughly symmetrical about their peak value, and thus which do not have a symmetry characteristic of a desired pulse;

which arrangement is such that the pulse curvature and pulse width discriminating means are provided in parallel, and the pulse symmetry discriminating means is serially thereafter, and is thus effective for pulses in the waveform which have not yet been discriminated against.

4,318,048
PHASE SHIFTER CONTROL CIRCUIT

Ditmar H. Bock, Colden, N.Y., assignor to Calspan Corporation, Buffalo, N.Y.

Filed Apr. 4, 1980, Ser. No. 137,668
Int. Cl.³ G05F *1/68;* H03K *1/12*
U.S. Cl. 328—155 12 Claims



1. A control circuit for phase shifters, comprising;

(a) a first summing circuit for combining an input signal with a correction signal to produce a first output signal representing the sum thereof,

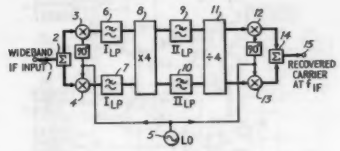
(b) an integrator circuit responsive to said first output signal for developing an integrated signal representing the time integral thereof, and

(c) a second summing circuit for combining said integrated signal with said correction signal to produce a second output signal representing the sum thereof.

4,318,049
CARRIER RECOVERY CIRCUIT FOR USE IN A MULTI-LEVEL PHASE SHIFT KEYING DEMODULATOR

Gregers E. Mogensen, Lyngby, Denmark, assignor to The Marconi Company Limited, Chelmsford, England

Filed Feb. 16, 1979, Ser. No. 12,726
Claims priority, application United Kingdom, Feb. 17, 1978, 6302/78
Int. Cl.³ H03D *3/18*
U.S. Cl. 329—50 7 Claims

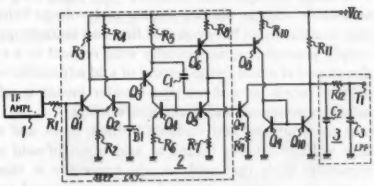


1. In a demodulator for use with a multilevel phase shift keying signal having N phase levels, a carrier recovery circuit including mixing means for mixing the p.s.k. signal with a locally generated signal having a frequency nominally the same as the p.s.k. signal to generate two base-band signals in phase quadrature with each other, multiplier means for frequency multiplying by a factor N components of each base-band signal, filter means for removing high frequency components from said frequency multiplied signals, means for frequency dividing by a factor of N two respective signals derived from the output of the filter means and means for mixing each divided signal with a signal derived from said locally generated signal to generate a signal related to a carrier frequency of the p.s.k. signal to enable the p.s.k. signal to be demodulated.

4,318,050
AM DETECTING CIRCUIT

Taiwa Okanobu, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 29, 1980, Ser. No. 126,018
Claims priority, application Japan, Mar. 2, 1979, 54-246697
Int. Cl.³ H03D *1/06, 1/18*
U.S. Cl. 329—101 3 Claims



1. An AM detecting circuit for detecting an AM signal having first and second polarities from a single-ended source comprising:

means for alternately producing a first drive signal when said AM signal has said first polarity and a second drive signal when said AM signal has said second polarity;

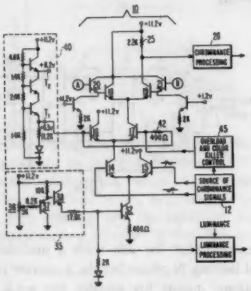
at least first and second class B amplifiers for separately amplifying said first and second drive signals to produce a negative feedback signal for application to said means for alternately producing; and

means responsive to at least one of said drive signals for producing a detected output.

4,318,051
SYMMETRICALLY GAIN CONTROLLED DIFFERENTIAL AMPLIFIER

Leopold A. Harwood, Bridgewater, and Erwin J. Wittmann, North Plainfield, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jan. 15, 1980, Ser. No. 107,401
Int. Cl.³ H03F 3/45
U.S. Cl. 330—254 10 Claims



1. An arrangement for symmetrically gain controlling a differential amplifier comprising first and second active devices each with an input gain control terminal, an output terminal, and interconnected common terminals, said arrangement comprising:

a first transistor with in input electrode, and output and common electrodes defining a main current conduction path of said first transistor coupled between first and second potentials;

means for biasing said first transistor to conduct a fixed current and to develop an associated prescribed fixed voltage at said output of said first transistor, said output voltage corresponding to a first control voltage and exhibiting a prescribed level related to the gain control bias requirements of said amplifier;

a second transistor with an input electrode, and output and common electrodes defining a main current conduction path of said second transistor coupled between first and second potentials;

adjustable voltage divider means coupled directly between first and second operating supply potentials for providing a variable voltage in accordance with the setting of said adjustable voltage divider means, said voltage being subject to adjustment between said first and second operating supply potentials symmetrically with respect to a voltage developed at a mid-range setting of said adjustable voltage divider means as said voltage divider means is adjusted between minimum and maximum settings;

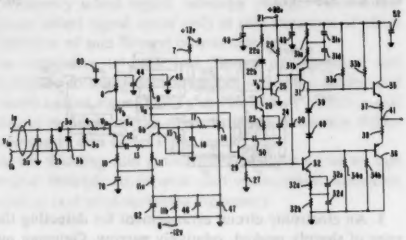
means for coupling said variable voltage from said adjustable voltage divider means to said input of said second transistor such that said second transistor is biased to conduct a variable current in response to said variable voltage independent of said fixed current of said first transistor and to develop an associated variable output voltage, corresponding to a second control voltage, substantially equal to said prescribed first control voltage when said adjustable voltage divider means is adjusted to a mid-range setting, and such that said second control voltage varies symmetrically with respect to said first control voltage over a range less than the difference between said first and second operating supply potentials as said adjustable voltage divider means is adjusted between minimum and maximum settings; and

means for coupling said first and second control voltages to respective input control terminals of said amplifier.

4,318,052
WIDEBAND HIGH VOLTAGE VIDEO AMPLIFIER

Joseph H. Colles, Oceanside, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Nov. 30, 1979, Ser. No. 99,173
Int. Cl.³ H03F 3/30
U.S. Cl. 330—255 12 Claims



1. A high voltage wideband video amplifier having a source supplying an input signal including a plurality of transistors of both npn and pnp types, comprising:

means connected to receive said input signal and receiving power from positive and negative reduced bias voltage sources for generating two intermediate signals corresponding to said input signal, one of said intermediate signals having a first d.c. bias level, the other of said intermediate signals having a second d.c. bias level;

a first output transistor of one of said npn and pnp types comprising a first base, a first emitter and a first collector, said first base connected to receive said one intermediate signal;

a first resistive network circuit biasing said first collector and said first emitter to a first d.c. bias voltage source;

a second output transistor of the other of said npn and pnp types comprising a second base, a second emitter and a second collector, said second base connected to receive the other of said intermediate signals;

a second resistive network circuit biasing said second collector and said second emitter to a second d.c. bias voltage source;

a first buffer transistor connected between said intermediate signal generating means and said first base of said first output transistor and a second buffer transistor connected between said second base of said second output transistor and said intermediate signal generating means;

said first d.c. bias level and said first d.c. bias voltage source being selected so that the maximum voltage swing in said input signal causes said first output transistor to alternate between near saturation and near cutoff; and

said second d.c. bias level and said second d.c. bias voltage source being selected so that the maximum voltage swing in said input signal causes said second output transistor to alternate between near saturation and near cutoff, wherein the relative magnitudes of said positive and negative reduced bias voltage sources of said generating means are sufficiently reduced below the relative magnitudes of the voltage of said first and second bias voltage sources so that said generating means may reliably operate at high frequencies compatable with video signals.

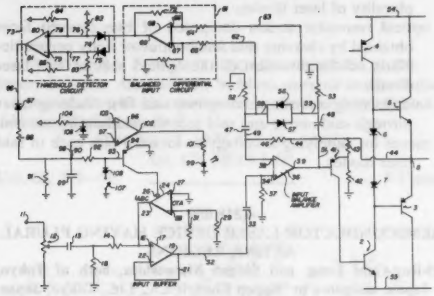
4,318,053
AMPLIFIER SYSTEM WITH AUTOMATIC DISTORTION CONTROL

Jack C. Sondermeyer, Meridian, Miss., assignor to Hartley D. Peavey, Meridian, Miss.

Filed Nov. 21, 1979, Ser. No. 96,317
Int. Cl.³ H03G 3/30
U.S. Cl. 330—281 10 Claims

1. An amplifier system for driving a loudspeaker or the like

comprising, in combination, an operational amplifier having an input port, an outlet port, a feedback port and a feedback network connected between said output port and said feedback port, detecting means connected between said output port and said feedback port for providing a differential output signal in the non-linear operating condition of said operational amplifier proportional to the percent clipping of the output signal of said operational amplifier in said non-linear condition, a balanced differential circuit connected to said detecting means for providing an amplified output signal in response to said differential



output signal, a storage capacitor, a full wave threshold detector circuit connected to said differential circuit and to said storage capacitor for charging said storage capacitor in response to said amplified output signal from said differential circuit, input circuit means including a variable gain amplifier for applying an input signal to said operational amplifier input port and means for applying current corresponding to the voltage stored in said storage capacitor to said variable gain amplifier to reduce the gain of said input signal for minimizng the clipping and therefore the distortion of said operational amplifier output signal.

4,318,054

INPUT CIRCUIT OF AUDIO AMPLIFIER

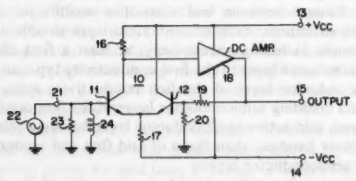
Kenji Yokoyama, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jan. 31, 1980, Ser. No. 117,271

Claims priority, application Japan, Feb. 7, 1979, 54-12897; Feb. 7, 1979, 54-14481[U]; Feb. 7, 1979, 54-14482[U]

Int. Cl.³ H03F *3/183;* H03H *11/00*

U.S. Cl. 330—302 **9 Claims**



1. An input circuit of an audio amplifier with an input terminal to be connected to a signal source, comprising:

a first-stage amplifier circuit including as an amplifying element a bipolar transistor the base of which is direct-coupled to said input terminal without a capacitor coupled therebetween; and

a parallel circuit of a resistor and an inductance connected between the base of said bipolar transistor and circuit ground.

4,318,055

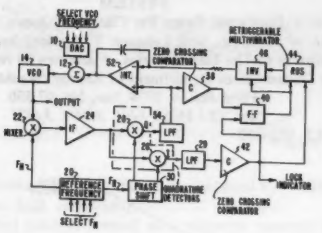
DIGITALLY CONTROLLED PHASE LOCK DISTILLATOR SYSTEM

Francis W. Hopwood, Severna Park; John P. Muhlbaier, Joppa, both of Md.; Jeffrey T. Oakes, Morrisville, N.C., and James T. Haynes, Elicott City, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 27, 1979, Ser. No. 70,232

Int. Cl.³ H03L *7/16*

U.S. Cl. 331—12 **6 Claims**



1. A phase locked loop system for generating a signal having a selected frequency, comprising:

(a) a frequency source for generating a reference signal;

(b) means for generating a signal specifying the desired frequency of a voltage controlled oscillator;

(c) an oscillator for generating an output signal whose frequency is determined by the amplitude of a control signal;

(d) quadrature detector compare means for comparing the frequency of said output signal to the frequency of said reference signal to generate a difference signal indicating that the output frequency of said oscillator is not the desired value;

(e) means responsive to said signal specifying the desired frequency of said voltage controlled oscillator and a signal corresponding to said difference signal to change the amplitude of said control signal to maintain the frequency of said output signal at the desired value.

4,318,056

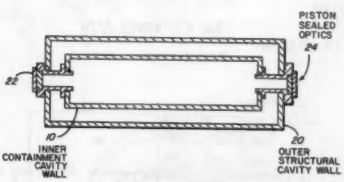
EXCIMER LASER WITH FLUOROPOLYMER LINING

Robert C. Sze, Santa Fe, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 17, 1978, Ser. No. 934,763

Int. Cl.³ H01S *3/03, 3/223*

U.S. Cl. 372—57 **1 Claim**



1. In an excimer laser, a multi-atmospheric halogen compatible cavity structure comprising:

a rigid outer supporting structure which is substantially nonreactive to gases containing halogens;

an inner containment cavity constructed of a tetrafluoroethylene polymer disposed within said rigid outer supporting structure;

an excimer laser gas including halogen gas contained within said rigid outer supporting structure and said inner con-

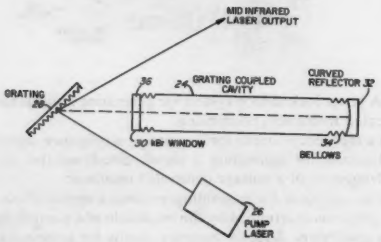
tainment cavity at a single predetermined multi-atmospheric pressure to maintain pressure equalization of said inner containment cavity and thereby maintain structural integrity of said inner containment cavity and minimize contamination of said excimer laser gas resulting from permeation of said excimer laser gas through said inner containment cavity.

4,318,057

OPTICALLY PUMPED ISOTOPIC AMMONIA LASER SYSTEM

Melvin I. Buchwald, Santa Fe; Claude R. Jones, Los Alamos, both of N. Mex., and Leonard Y. Nelson, Seattle, Wash., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 4, 1979, Ser. No. 47,550
Int. Cl.³ H01S *3/05, 3/094, 3/223*
U.S. Cl. 372—70 **10 Claims**



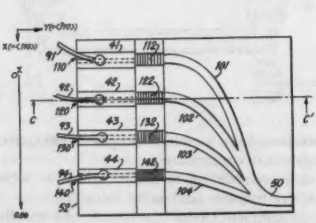
1. An optically pumped laser system comprising:
deuterated molecular ammonia gas;
laser excitation means for optically pumping R(J) of the $O \rightarrow \nu_2$ vibration transition in said deuterated molecular ammonia gas;
optical resonant cavity means for enhancing lasing on P(J) of the $\nu_2 \rightarrow O$ vibrational transition of said deuterated molecular ammonia gas by enhancing rotational cascade lasing including stimulated Raman effects in the far infrared.

4,318,058

SEMICONDUCTOR DIODE LASER ARRAY

Ikuo Mito; Shigeo Matsushita, and Kohroh Kobayashi, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Apr. 22, 1980, Ser. No. 142,743
Claims priority, application Japan, Apr. 24, 1979, 54-49814; May 18, 1979, 54-61996; May 18, 1979, 54-61997; Jun. 8, 1979, 54-71110
Int. Cl.³ H01S *3/19*
U.S. Cl. 372—50 **7 Claims**



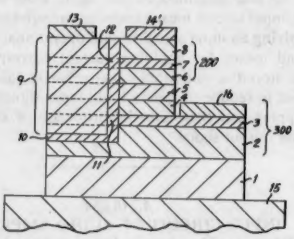
1. A monolithically integrated laser array capable of providing light rays of a plurality of wavelengths, said array comprising a semiconductor body having:
a semiconductor substrate;
a multi-layer structure formed on said substrate,
said multi-layer structure comprising an active layer, a first cladding layer, and a second cladding layer separated from said first cladding laser by said active layer,
said active layer being composed of a mixed crystal, the energy band gap of said active layer varying in a predetermined first direction of a plane lying in said active layer;
means for electrically isolating regions of said multi-layer structure in parallel to a second directon perpendicular to said predetermined first direction and for providing a plurality of laser diodes;
optical resonator means composed of two cleaved faces obtained by cleaving said semiconductor body perpendicularly to the direction of the optical axes of said laser diodes;
said isolating means extending into said first cladding layer through said active and said second cladding layers; and
means for supplying a voltage to forward bias each of said laser diodes.

4,318,059

SEMICONDUCTOR LASER DEVICE HAVING PLURAL ACTIVE REGIONS

Hi-Roy-Oshi Lang, and Shigeo Matsushita, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jun. 13, 1980, Ser. No. 159,382
Claims priority, application Japan, Jun. 13, 1979, 54-73466
Int. Cl.³ H01S *3/19*
U.S. Cl. 372—47 **2 Claims**



1. A monolithically integrated semiconductor laser device capable of providing a plurality of light beams, each light beam being different in wave length, said laser device comprising:
a semiconductor substrate of a first conductivity type
a plurality of multi-layer double heterostructures, formed sequentially on said semiconductor substrate, and having a separating semiconductor layer of a second conductivity type formed between said respective multi-layer double hetero-structures, each of said multi-layer double hetero-structures including successively, at least a first cladding semiconductor layer of the first conductivity type, an active semiconductor layer of the first conductivity type, and a second cladding semiconductor layer of the first conductivity type, said active semiconductor layer having a relatively narrower band gap than those of said first and second cladding semiconductor layers;
a diffusion region diffused with the impurity of the second conductivity type to convert the conductivity type of said diffusion region to said second conductivity type;
said diffusion region reaching said first cladding semiconductor layer of said multi-layer double hetero-structure, adjacent to said semiconductor substrate, and through said plurality of multi-layer double hetero-structures and at least one of said separating semiconductor layers, thereby forming transversely a plurality of p-n junctions in said active semiconductor layers, each of said p-n junctions causing an active region adjacent to said p-n junction to emit stimulated

radiation when said p-n junctions are forward biased and pumped with current above a threshold current level;

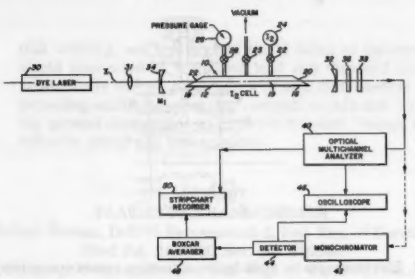
means for separately forward biasing each of said p-n junctions and for applying current thereto; and means for providing feedback of said stimulated radiation to said active region.

4,318,060

OPTICALLY PUMPED ATOMIC IODINE LASER

Steven J. Davis, Albuquerque, N. Mex., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 1, 1979, Ser. No. 35,136
Int. Cl.³ H01S *3/00*
U.S. Cl. 372—70 **5 Claims**



1. A laser pumped atomic laser for emitting coherent radiation whose wavelength is independent of the wavelength of the laser employed to pump said atomic laser over the range of 493–501 nm, said atomic laser comprising:

a sealed cell means forming a lasing cavity, said lasing cavity containing a nondegradable active gaseous medium that is substantially composed of diatomic molecules of a single chemical element, capable of being pumped to a lasing state repeatedly, by photodissociation of the diatomic molecules into atoms, said sealed cell having Brewster's-angle end windows at opposite ends thereof,

laser pump means for generating a beam of coherent radiation that pumps the gaseous medium in said lasing cavity to a lasing condition, said laser pump means being positioned adjacent said sealed cell means and oriented such that the optical axes of said laser pump means and said lasing cavity coincide, and the beam from said laser pump means enters said lasing cavity through one of the end windows to pump the gaseous medium and cause a population inversion therein, and

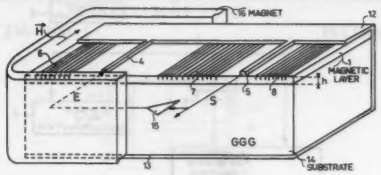
two mirrors mounted in a substantially confocal configuration on the optical axis of said lasing cavity to form an optical cavity for said laser to extract a beam of coherent radiation from the lasing mixture in said lasing cavity, the first one of said two mirrors being positioned between said laser pump means and said sealed cell such that the beam from said laser pump means passes therethrough into the lasing cavity, the second one of said two mirrors being positioned on the side of said sealed cell away from said laser pump means, said two mirrors transmitting the beam from said laser pump means but reflecting substantially all radiation emitted by the gaseous medium in the lasing cavity.

4,318,061

TUNABLE MICROWAVE OSCILLATOR USING MAGNETOSTATIC WAVES

Jean-Paul Castera, and Jean-Marie Dupont, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jan. 24, 1980, Ser. No. 115,080
Claims priority, application France, Jan. 26, 1979, 79 02096
Int. Cl.³ H03H *9/00*
U.S. Cl. 331—107 A **7 Claims**



1. A microwave oscillator which can be tuned by a variation of a magnetic field, comprising:

two coupled cavities formed in a magnetic material layer and forming a first resonator used as a multimode filter and a second resonator used as a monomode filter, respectively with the second resonator filtering one of the modes transmitted in said first resonator, an input transducer for exciting magnetostatic waves in said first cavity;

an output transducer for an extraction of a signal corresponding to the waves transmitted in said second cavity;

amplifier means with an input and an output respectively connected to said output transducer and said input transducer; and

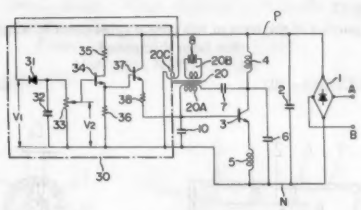
electromagnetic means for subjecting said two cavities to an external magnetic field.

4,318,062

ULTRASONIC WAVE NEBULIZER DRIVING CIRCUIT

Sadao Mitsui, Chiba; Minoru Takahashi, Funabashi, and Keiichi Watanabe, Ichikawa, all of Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Jul. 30, 1979, Ser. No. 61,983
Claims priority, application Japan, Aug. 14, 1978, 53-98244
Int. Cl.³ H03B *5/36*; H03L *5/02*
U.S. Cl. 331—109 **3 Claims**

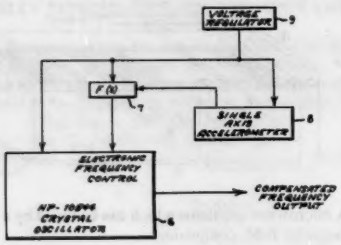


1. In an ultrasonic wave nebulizer driving circuit that includes an oscillator for driving a piezo-electric vibrator generating ultrasonic waves, the improvement wherein said driving circuit includes a transistor oscillator therein coupled to said vibrator to power said vibrator and whose base current is controlled in order to control oscillation, and further comprising an output stabilizing circuit which detects the output of said oscillator as applied to said vibrator and controls said output by negatively feeding back a part of said output to the base circuit of the transistor to vary said base current when said oscillator output varies to counteract that variation.

4,318,063
CRYSTAL OSCILLATOR COMPENSATED FOR G-SENSITIVITY

Joseph M. Przyjemski, Carlisle, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 3, 1979, Ser. No. 35,578
Int. Cl.³ H03B *5/32*
U.S. Cl. 331—158 **1 Claim**



1. The method of fabricating a g-sensitivity compensated crystal oscillator comprising the steps of

providing a crystal oscillator having electronic frequency control,

determining the plane of zero g-sensitivity of said crystal oscillator,

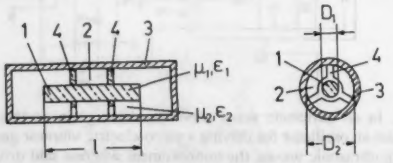
providing a single axis accelerometer having an output means

affixing said accelerometer to said crystal oscillator in a physical orientation relative thereto that is effective to detect components of acceleration normal to said plane of zero g-sensitivity and whereby said accelerometer will generate frequency correction voltage output signals in response to said components of acceleration, and p1 connecting said accelerometer output to said electronic frequency control.

4,318,064
RESONATOR FOR HIGH FREQUENCY ELECTROMAGNETIC OSCILLATIONS

Alfred Käch, Untersiggenthal, Switzerland, assignor to Patelhold Patentverwertungs- & Elektro-Holding AG, Glarus, Switzerland

Filed May 19, 1978, Ser. No. 907,578
Claims priority, application Switzerland, May 20, 1977, 6279/77
The portion of the term of this patent subsequent to Aug. 5, 1997, has been disclaimed.
Int. Cl.³ H01P *1/20, 7/10*
U.S. Cl. 333—202 **22 Claims**



1. A resonator for high frequency electromagnetic oscillations, comprising:

means defining a generally tubular volume having one region thereof filled with a first material having a first dielectric constant;

a solid dielectric wire located within a second region of said volume, said dielectric wire being formed of a second material having a second dielectric constant which is greater than said first dielectric constant; and

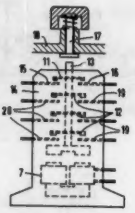
means for electromagnetically shielding said generally tubular volume, said means comprising a metal shield means;

the dimensions of said dielectric wire being such that, for any given resonance frequency and for said first and second dielectric constants, an E_{0m}-wave (circular magnetic field, m=1,2,3, . . .) is established in said wire and a standing TEM-wave is established in said generally tubular volume.

4,318,065
MEANS FOR ACTUATING ELECTRO-MAGNETIC SWITCHGEAR

Werner Harbauer, Schwandorf, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Dec. 2, 1980, Ser. No. 212,217
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1979, 2948959
Int. Cl.³ H01H *73/12*
U.S. Cl. 335—17 **3 Claims**



1. Electromagnetic switchgear actuation means comprising:

a switch position indicator comprising magnetic means;

an electromagnet comprising a coil;

a leading contact comprising a first fixed part and a first movable part, the leading contact being connected in series with the electromagnet coil and a source of current and the movable part of the leading contact being mechanically connected to the switch position indicator to be moved thereby to actuated position in contact with the first fixed part to connect the coil to the source of current to energize the electromagnet and hold the leading contact closed;

at least one following main contact comprising a second fixed part and a second movable part connected to the switch position indicator to be moved thereby to an actuated position in contact with the second fixed part following the movement of the leading contact into the actuated position thereof, wherein the switch position indicator connected with the yoke and carrying all the moving contacts is of such construction and arranged in such a manner that only the leading contact forming the "on" key is closed on maximum operating travel of said switch position indicator.

4,318,066
EXTERNALLY SHIELDED DISK WINDINGS FOR TRANSFORMERS

Robert C. Degeneff, and William N. Kennedy, both of Pittsfield, Mass., assignors to General Electric Company

Filed May 19, 1980, Ser. No. 151,189
Int. Cl.³ H01F *15/04*
U.S. Cl. 336—70 **12 Claims**

1. A transformer comprising:

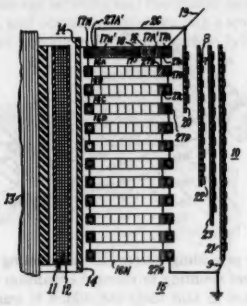
a core;

a first winding arranged around said core;

a disk winding having a ground capacitance surrounding said first winding and consisting of a plurality of wire

turns axially arranged along said core in a plurality of winding sections;

at least first and second external electrostatic shields extending along the opposite side of said disk winding from said core, said first shield being an innermost shield connected with a line lead an disposed adjacent the line end of said



disk winding, and said second shield being an outermost shield connected to a ground lead and disposed along substantially the full axial length of said disk winding for providing additional charging currents to said disk winding ground capacitance to improve transient voltage distribution along said disk winding.

4,318,067

FLAT-TYPE TRANSFORMER

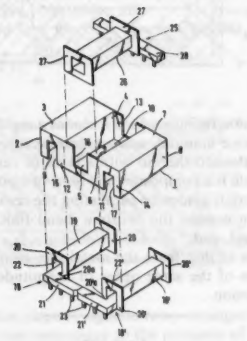
Norbert Weiner, D-5275 Bergneustadt 2, Fed. Rep. of Germany

Filed Jul. 21, 1980, Ser. No. 170,563

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1979, 2930387

Int. Cl.³ H01F *27/02, 27/30*

U.S. Cl. 336—90 **11 Claims**



1. In a transformer of the type including iron core limbs lying in one plane, each of said limbs being associated with a different one of a plurality of coil arrangements, each coil arrangement comprising a coil, wound on a flanged coil form, with the coil's lead-out wires electrically connected to terminals provided at the outside of the coil form, the improvement comprising:

an insulating housing defining pockets housing each coil arrangement, with said limbs being insertable in said coil forms through said pockets, said housing defining cutouts, which are dimensioned to facilitate the outsides of the coil forms at which the terminals are provided to extend out of said housing, and further dimensioned to accommodate the iron core limbs therein and which are at right angles with respect to the limbs and partially overlap the corresponding flanges of the coil forms.

4,318,068

INDUCTION DEVICE EQUIPPED WITH VIBRATION SUPPRESSOR

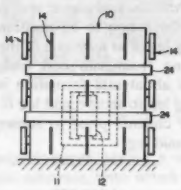
Yasuro Hori, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 18, 1980, Ser. No. 160,662

Claims priority, application Japan, Jun. 22, 1979, 54/78158

Int. Cl.³ H01F *15/00*

U.S. Cl. 336—100 **10 Claims**



1. An induction device equipped with a vibration suppressor, comprising: a tank accommodating therein an inductor including a magnetic iron core and windings wound onto said magnetic core; and rod-like vibration elements, each encluding a beam portion extending in parallel to the outer circumferential surface of the exterior wall of said tank and a fitting portion having one end thereof stationarily fixed to said beam portion and the other end stationarily fixed to the outer circumferential surface of the exterior wall of said tank so that no relative movement occurs between the one end of said fitting portion and said beam portion at the fixed connection thereof and no relative movement occurs between the other end of said fitting portion and the outer circumferential surface of the exterior wall of said tank at the fixed connection thereof, said beam portion being spaced from the exterior wall of said tank solely by the fitting portion; the width D of said beam portion in the direction perpendicular to the outer circumferential surface of the exterior wall of said tank being greater than the width W of said beam portion in the direction at right angles to both the width D and the length of said beam portion.

4,318,069

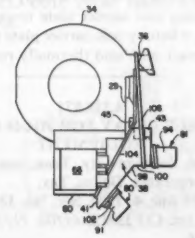
BOBBIN WITH TERMINAL BLOCK DESIGNED FOR MACHINE WRAP

John B. Morse, Boston, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 23, 1979, Ser. No. 96,614

Int. Cl.³ H01F *15/10*

U.S. Cl. 336—192 **13 Claims**



1. A bobbin for an electromagnetic device having a coil, and electrical terminals having lead receiving legs to be connected with wire leads said bobbin comprising:

a spool portion having a winding axis about which the coil is formed by winding a continuous length of wire maintained under tension, and at least one flange lying in a plane substantially perpendicular to said winding axis;

guide means connecting to said spool portion for engaging the wire extending from the coil under tension so that the wire may be extended to and wrapped around at least one of the lead receiving legs of the electrical terminals while maintained under tension; and

a terminal block portion connecting to said spool portion and spaced axially apart from said flange having a planar wall portion with two substantially parallel channels formed thereon positioned parallel to the lead receiving legs of the terminals, said planar wall portion also defining a projecting formation to be positioned adjacent to the lead receiving leg of at least one of the terminals whereby wire extending from said coil under tension may be wrapped first about said formation and then about said lead receiving leg to secure said leg to said formation and its respective channel prior to subsequent wraps of the wire around said leg.

4,318,070

SPRING BIASED ACTUATOR FOR A THERMAL DELAY VALVE OR SWITCH

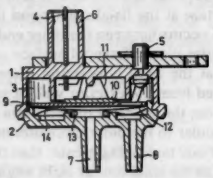
Rolf Dohrmann, Neuss; Ulrich Henke, Alsdorf, and Wojciech Marusiak, Düsseldorf, all of Fed. Rep. of Germany, assignors to Pierburg GmbH & Co. KG, Neuss, Fed. Rep. of Germany

Filed Jan. 3, 1980, Ser. No. 109,267

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1979, 2903561

Int. Cl.³ H01H *61/02*

U.S. Cl. 337—3 **11 Claims**



1. An actuator for use in an electrically heated thermal delay valve or switch, said actuator comprising a housing, a thermally responsive plate, a periphery of said thermally responsive plate being fixed to said housing, a central part of said thermally responsive plate forming a temperature-dependent control element, a metal carrier plate, a PTC element mounted on said metal carrier plate, said metal carrier plate and said PTC element being located in said housing and being free to move in a direction normal to said carrier plate, and at least one spring, said at least one spring electrically contacting said PTC element and biasing said carrier plate towards said thermally responsive plate, whereby said carrier plate is constantly urged into thermal contact with said thermally responsive plate.

4,318,071

INTERFACE RELAY FOR HIGH CURRENT EQUIPMENT

Glen C. Shepherd, Johnson City, Tenn., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 4, 1980, Ser. No. 137,338

Int. Cl.³ H01H *61/00, 71/18*

U.S. Cl. 337—136 **28 Claims**

1. A surface element relay for changing the state of the switch contacts forming a part of a high current equipment circuit comprising:

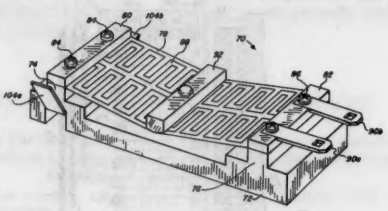
a frame,

a non-electrically conductive, flexible, thermally expansive substrate connected to said frame,

electric heating element in contact with said substrate,

a biasing member in contact with said substrate,

a pre-loaded mechanical member in contact with said biasing member for producing a shallow V-shape in said substrate, and



means for providing current to said heating element to produce heat resulting in thermal expansion and motion amplification in said substrate which is transmitted to said biasing member and said pre-loaded mechanical member thereby causing the switch contacts to change state.

4,318,072

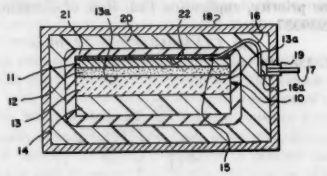
PRECISION RESISTOR WITH IMPROVED TEMPERATURE CHARACTERISTICS

Felix Zandman, Philadelphia, Pa., assignor to Vishay Intertechnology, Inc., Malvern, Pa.

Filed Sep. 4, 1979, Ser. No. 72,003

Int. Cl.³ H01C *7/06*

U.S. Cl. 338—7 **25 Claims**



1. A precision resistor which includes a metal film constituting the resistive material, and a substrate supporting the film and firmly attached thereto with a layer of cement, wherein

the substrate is a composite of at least two portions of different materials generally paralleling the resistive metal film,

the portion nearest the resistive metal film being substantially rigid, and

the portion farther from the metal film being a plastic of a thickness of the same order of magnitude as that of the rigid portion.

4,318,073

TEMPERATURE SENSOR

Frederick W. Rossler, Jr., New Port Richey, and Steven Feldman, Seminole, both of Fla., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 29, 1980, Ser. No. 182,567

Int. Cl.³ H01C *7/04*

U.S. Cl. 338—28 **6 Claims**

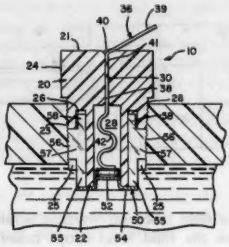
1. A temperature sensor of the type having a sensing end which contacts the medium whose temperature is to be measured and a signal end where an electrical conductor is attached comprises:

a thermally and electrically insulative body member having a sensing end and a signal end and having a passage therethrough between said ends,

a thermally and electrically conductive sensing member in said passage at said sensing end, said sensing member having retaining means by which it is retained in the passage and grounding means by which a signal current passes to ground,

a thermistor in said passage against said sensing member,

an electrically conductive contact member which is continuous in said passage between said thermistor and said signal sending end, said contact member having a spring portion and a contact portion, said spring portion lying between



said thermistor and said contact portion, said passage in said body member being profiled with a bore portion toward said sensing end which loosely accommodates said spring portion and a retention portion toward said signal end which closely accommodates said contact portion, said passage having a shoulder therein which restricts the size of said passage between said bore portion and the signal sending end of the body, said contact portion of said contact member having a should thereon which bears against said shoulder in said passage, whereby said spring portion maintains resilient contact with said thermistor.

4,318,074

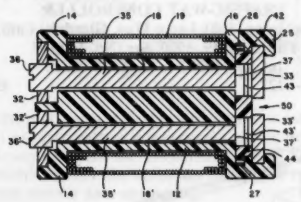
CONTACTLESS ELECTROMAGNETIC RELAY

Robert J. Sabon, Chicago, Ill., assignor to GTE Automatic Electric Labs Inc., Northlake, Ill.

Filed Oct. 14, 1980, Ser. No. 196,941

Int. Cl.³ H01L *43/04*

U.S. Cl. 338—32 H **15 Claims**



1. A contactless electromagnetic relay arranged to assume a first switching state responsive to the presence of an electrical current and second switching state responsive to the absence of said electrical current said relay comprising:

flux generating means producing a magnetic flux of a first density in response to the presence of said electrical current;

at least one pair of flux circuit means each situated adjacent said flux generating means and each including an air gap having said flux conveyed therethrough;

at least first and second magnetic switching means each disposed within a different one of said pair of air gaps, responsive to said flux of said first density rendering said first switching means operated and said second switching means non-operated;

whereby, said relay assumes said first switching state.

4,318,075

THICK-FILM POTENTIOMETER

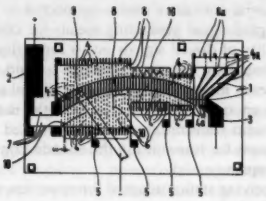
Heinz Pudelko, Frankfurt am Main, and Klaus Weber, Kronberg, both of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 7, 1980, Ser. No. 175,979

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1979, 2932714

Int. Cl.³ H01C *10/32*

U.S. Cl. 338—162 **13 Claims**



1. In a rotary potentiometer having a support substrate, particularly a ceramic substrate, onto which there is applied a plurality of conductor lines arranged adjacent to each other, a resistance track of resistance composition on the conductor lines, a portion of the conductor lines forming a wiper track which extends adjacent to along the resistance track and over which a contact point of a wiper is swingable in a curved path about an axis of rotation, the improvement wherein

said conductor lines and said resistance track are films applied on the substrate in thick film technology construction, said conductor lines are narrow compared with the length of said wiper track and are arranged, spaced apart from each other, substantially at right angles to said wiper track,

said resistance track is arranged on said support substrate exclusively outside of said wiper track upon and adjacent to said conductor lines,

said conductor lines at least in the area of said wiper track are all arranged parallel to all of each other,

the distance between every two adjacent of said conductor lines is approximately equal to the width of each of said conductor lines,

said conductor lines have a rectangular flat surface facing the wiper on which the contact point of the wiper engages,

at least a portion of said resistance track is arranged on both sides of said wiper track.

4,318,076

DYNAMIC CLIMATIC CONDITION INDICATING SYSTEM

John H. Whitfield, Hanceville, Ala., assignor to Dais Corporation, Warrior, Ala.

Filed Aug. 5, 1980, Ser. No. 175,560

Int. Cl.³ G01C *21/00*; H04Q *9/00*

U.S. Cl. 340—27 NA **8 Claims**

1. A system for providing within the cockpit of an aircraft to the operator thereof a dynamic indication of climatic conditions at an airport, said system comprising:

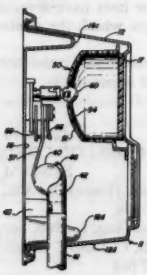
a. a transmitting station adapted for operation at an airport and including:
(1) a plurality of input means adapted for connection to a like plurality of climatic condition sensors for receipt therefrom of dynamic climatic condition data indicative of climatic conditions at the airport;
(2) a like plurality of digital signal generating means connected to said plurality of input means for generating a like plurality of digital signals indicative of the climatic conditions indicated by the data;
(3) serial converter means connected to said plurality of digital signal generating means for converting the plurality of digital signals into a serial digital signal;
(4) encoding means connected to said serial converter means for encoding the serial digital signal to provide an encoded signal indicative of the data; and
(5) radio transmitting means connected to said encoder means for transmitting the encoded signal on a selected frequency; and
b. a receiving station adapted for operation within an aircraft and including:
(1) radio receiving means, including frequency selection means, for receiving the encoded signal as transmitted on the selected frequency by said radio transmitting means;
(2) decoding means for decoding the encoded signal as received by said radio receiving means to provide the dynamic climatic condition data; and
(3) display means adapted for operation within the cockpit of an aircraft for displaying to the operator thereof a dynamic indication of the climatic conditions at the airport.

4,318,077

VEHICLE PARKING AID

Frank J. Bubnich, and Marketta A. Bubnich, both of 3224 Emmaus, Zion, Ill. 60099

Filed Oct. 29, 1979, Ser. No. 88,830
Int. Cl.³ G08G *1/14;* B60Q *1/48*
U.S. Cl. 340—51 **4 Claims**



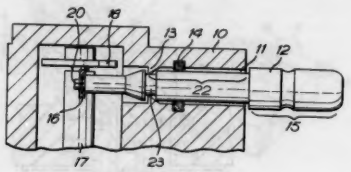
1. A vehicle parking guide and signaling device comprising; a housing section adapted to be supported in a parking area, said housing section enclosing an electrical circuit and switch means for opening and closing said circuit operatively connected with a signaling means, said switch means having a movable lever arm associated therewith, a switch actuating resilient expandable means comprising an elastic bulb being maintained in direct engagement with said lever arm within said housing section, and said elastic bulb operatively connected with an elongated fluid filled deformable tubular member adapted to expand said elastic bulb when said deformable tubular member is deformed and move said lever arm so as to effect closing of said electrical circuit.

4,318,078

BRAKE FLUID LEVEL WARNING APPARATUS

Hans-Dieter Reinartz, and Horst Quitmann, both of Frankfurt am Main, Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Jun. 9, 1980, Ser. No. 157,742
Claims priority, application Fed. Rep. of Germany, Jul. 24, 1979, 2929858; Jul. 24, 1979, 2929941
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—59 **32 Claims**



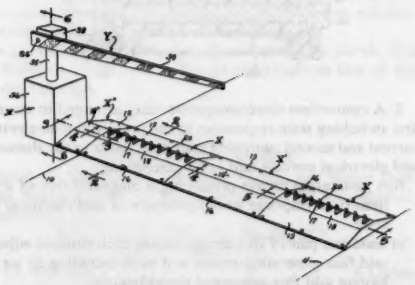
1. A brake fluid reservoir warning arrangement which responds when the fluid level drops below a predetermined minimum level comprising:
two spaced contact pins extending into said reservoir;
a contact disc disposed on a float in said reservoir to electrically connect said contact pins together when said fluid level drops below said minimum level to light a lamp in a warning indicator circuit; and
a checking arrangement to check said warning arrangement including
a manually operated arrangement associated with said contact pins to provide an electrical connection therebetween to light said lamp when said warning indicator circuit is intact,
said manually operated arrangement including a knob on the end of said contact pins remote from said float to enable manual axial displacement of said contact pins and said contact disc is thickened on a diametric circle thereof to provide said electrical connection between said contact pins when they are axially displaced.

4,318,079

MOTORIZED TIRE BARRIER AND SIGNAL BARRIER TRAFFIC-WAY CONTROLLER

Harry D. Dickinson, 1681 Larco Way, Glendale, Calif. 91202

Filed Jun. 19, 1980, Ser. No. 160,945
Int. Cl.³ G08G *1/02;* E01F *11/00*
U.S. Cl. 340—127 **19 Claims**



1. A motorized tire barrier and signal barrier vehicle traffic-way controller, and including:
at least one elongated grade level tire barrier module extending transversely of the vehicle traffic-way, and comprised of a frame with oppositely ramped margins extending to spaced rail members defining a channel for the accommodation of a

shaft rotatable therein and coextensive therewith, and a plurality of spaced blades projecting from one side of the shaft to extend upwardly from and retractile into the channel through rotation of the shaft;

a signal barrier at one side of the traffic-way, and comprised of a vertically disposed frame with a standard and a head defining a chamber for the accommodation of a shaft rotatable therein, and an arm projecting from the shaft to extend horizontally across the traffic-way and retractile into a vertical position at the side of the traffic-way through rotation of the shaft;

a drive unit for motorizing the blades and arm between extended "stop" positions and retracted "go" positions, and comprised of a reversible motor drive means with a bellcrank reciprocably operable through an obtuse angular displacement, with a connecting link from a first bellcrank to a lever on the at least one module shaft reciprocably operable through an acute angular displacement, and with a connecting link from a second bellcrank to a lever on the signal arm shaft reciprocably operable through an acute angular displacement;

and control means for reversibly operating the motor drive means and positioning the tire barrier and signal barrier shafts in said "stop" and "go" positions.

4,318,080

DATA PROCESSING SYSTEM UTILIZING ANALOG MEMORIES HAVING DIFFERENT DATA PROCESSING CHARACTERISTICS

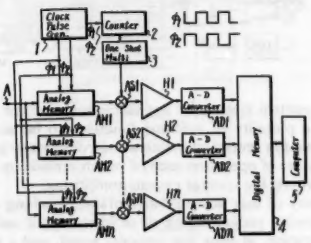
Hajime Yoshida, Tokyo, Japan, assignor to Hajime Industries, Ltd., Tokyo, Japan

Continuation of Ser. No. 860,207, Dec. 13, 1977, abandoned. This application Sep. 11, 1979, Ser. No. 74,539

Claims priority, application Japan, Dec. 16, 1976, 51/151060

Int. Cl.³ G06K 9/00

U.S. Cl. 340—146.3 Q **4 Claims**



1. A data processing system in which pattern data of a predetermined standard pattern is memorized and an unknown input data is compared with the memorized pattern data to determine whether or not the unknown input data resembles the memorized pattern data comprising:

clock pulse generator means for producing two phase clock pulses;

a plurality of analog memory means each having different transfer characteristics, an input analog signal to be sampled and processed during a sampling period being applied simultaneously to each of said analog memory means and said two phase clock pulses from said clock pulse generator means being applied simultaneously to each of said memory means so that each of said memory means produces a single output representing said input analog signal during the sampling period;

a plurality of analog switching means equal in number to the number of said analog memory means which receive the outputs of said analog memory means, respectively;

a plurality of sampling hold means equal in number to the number of said analog memory means which receive output analog signals from said plurality of analog memory means through said plurality of switching means, respectively;

a control means supplied with said two phase clock pulses from said clock pulse generator and producing a control signal which occurs at the end of the sampling period which is applied commonly to said plurality of analog switching means to close said analog switching means simultaneously;

a plurality of analog-digital converter means equal in number to the number of said analog memory means which receive the analog output signals from said plurality of sampling hold means and convert said analog output signals into digital signals;

a digital memory receiving said digital signals from said plurality of analog-digital converter means;

a computer receiving the output of said digital memory; and

wherein each of said analog memory means consists of a plurality of operational amplifiers, a second of plurality of switches, said plurality of operational amplifiers and second plurality of switches being alternately connected in cascade, a plurality of memory means each connected between adjacent ones of said second plurality of switches and said operational amplifiers, a plurality of taps connected to output terminals of said plurality of operational amplifiers, a plurality of resistors of different ohmic values connected to said plurality of taps, respectively, and a further operational amplifier with its input terminals connected to said resistors.

4,318,081

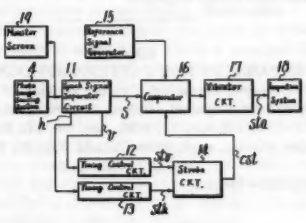
OBJECT INSPECTION SYSTEM

Hajime Yoshida, Tokyo, Japan, assignor to Hajime Industries Ltd., Tokyo, Japan

Filed Dec. 19, 1979, Ser. No. 105,294

Int. Cl.³ G06K 9/32

U.S. Cl. 340—146.3 H **3 Claims**



1. An object inspection system comprising:

(a) a photo image sensing device picking up an object to be inspected and delivering a complex video signal having at least a horizontal synchronizing signal, a vertical synchronizing signal and a video signal;

(b) means for separating said horizontal and vertical synchronizing signals and said video signal from said complex video signal;

(c) means for producing a comparative control signal based upon the horizontal and vertical synchronizing signals;

(d) means for generating a reference signal which is responsive to a characteristic of said video signal;

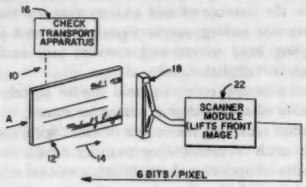
(e) means for comparing the video signal with the reference signal only within a period determined by the comparative control signal and for producing an inspection start signal; and

(f) means for inspecting said object when the inspection start signal is supplied thereto.

4,318,082
METHOD AND APPARATUS FOR ELECTRONICALLY ALIGNING ACTIVE ELEMENTS OF AN IMAGING ARRAY WITH AN OPTICAL SYSTEM

John T. King, Waterloo, Canada, assignor to NCR Canada Ltd - NCR Canada Ltee, Mississauga, Canada

Filed Dec. 31, 1979, Scr. No. 108,875
Int. Cl.[3] G06K 9/32
U.S. Cl. 340—146.3 H 9 Claims

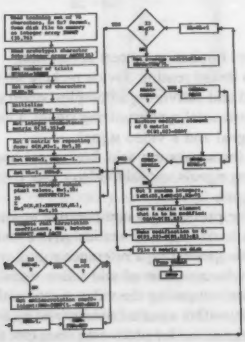


1. An imaging apparatus comprising:
an array having a central axis and also having a predetermined number of light responsive elements positioned in said array, with each said light responsive element producing an output in response to light impinging thereon;
an optical system including means for directing light from an image of a predetermined size onto a first number of said light responsive elements which said first number is less than said predetermined number;
first means including a programmable logic array for selecting a said first number of said light responsive elements which are positioned with regard to said central axis;
means for receiving said outputs of said selected first number of light responsive members and also for generating a stream of data therefrom; and
second means for entering thereon different settings which cooperate with said first means for adjustably selecting out of said predetermined number the particular said first number of light responsive elements upon which light from said image impinges.

4,318,083
APPARATUS FOR PATTERN RECOGNITION

Percy E. Argyle, Penticton, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Canada

Filed Apr. 14, 1980, Ser. No. 140,300
Claims priority, application Canada, Jun. 29, 1979, 330864
Int. Cl.[3] G06K 9/64
U.S. Cl. 340—146.3 F 2 Claims

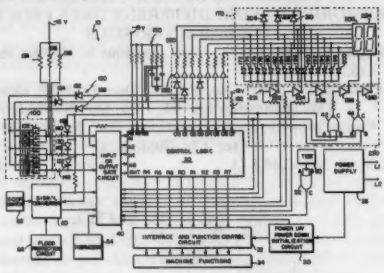


1. Apparatus useful for pattern recognition comprising:
(a) at least one two-dimensional array of nodal points, said points being occupied by summing means having input terminals and output terminals,
(b) a corresponding input array of points carrying voltage levels, said points being representative of a two-dimensional array of pixels the pattern of which is to be analysed,
(c) electrical connections from the input array of voltage points via resistors to the inputs of the summing means said connections being made in a predetermined pattern and the conductance value of the resistors being set by computational procedures such that a set of arbitrary input patterns of pixels characterized by an archetypal pattern is formed into output patterns that are analysable as to correlation between output patterns and the archetypal pattern, and
(d) means for analysing said output patterns by correlation discrimination.

4,318,084
CONTROL SYSTEM FOR APPLIANCES AND THE LIKE

Charles E. Scott, Noblesville; Robert L. Smith, Indianapolis, both of Ind., and Robert G. Bristol, Everett, Mass., assignors to Emhart Industries, Inc., Indianapolis, Ind.

Filed Dec. 3, 1979, Ser. No. 99,915
Int. Cl.[3] H01H 7/00
U.S. Cl. 340—309.1 13 Claims



1. A control system for appliances and the like of the type having a plurality of machine functions to be activated and deactivated in accordance with a control strategy and a plurality of cycles of operation each of which is made up of a plurality of events, the control system comprising:
an array of user actuable membrane switching devices for allowing programming of at least one of said cycles of operation, at least one optional event, and a time period for at least one of the plurality of events of the programmed cycle;
a control logic including microcomputer means having a resident program and a memory including performance data and means for storing data;
a display panel including means for indicating the programmed cycle, optional event, time period for the one event, and the time remaining in the programmed cycle during the operation of the appliance;
buffer gate means coupled between said array of switching devices, said microcomputer means and said display panel for increasing the input and output capabilities of said microcomputer means; and
said resident program having instruction means for operating said control system including first instruction means for retrieving said performance data from said memory in response to a programmed cycle, second instruction means for activating said display panel in response to said retrieved performance data, third instruction means for activating and deactivating machine functions in accordance with said retrieved data for performing the events of said programmed cycle, fourth instruction means responsive to said retrieved data for determining operational

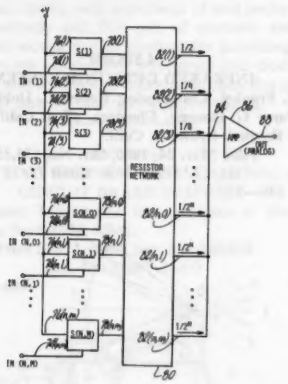
periods for said events of said programmed cycle, fifth instruction means responsive to said fourth instruction means for disabling certain of said switching devices at the completion of performance of certain of said events and for initiating the performance of the next sequential event for said programmed cycle at the completion of each event of said programmed cycle, sixth instruction means responsive to said fourth instruction means for enabling the inputting of certain selections via said array of switching devices during the performance of certain events of said programmed cycle and for returning the performance of said resident program to said second instruction means.

4,318,085

METHOD AND APPARATUS FOR CONVERSION OF SIGNAL INFORMATION BETWEEN ANALOG AND DIGITAL FORMS

Arliss E. Whiteside, Royal Oak, and William G. Wolber, Southfield, both of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed Jun. 1, 1978, Ser. No. 911,603
Int. Cl.³ H03K *13/02*
U.S. Cl. 340—347 DA **20 Claims**



1. A device for converting an n-bit digital word to an equivalent analog signal comprising:

addressable storage array means for outputing a special purpose (n+m)-bit digital word in response to a received n-bit digital word, said addressable storage array means storing a special purpose (n+m)-bit digital word corresponding to each received n-bit digital word, where the weight of each n-bit in said (n+m)-bit digital word is dependent upon its bit position and the weight of the bit positions are related to one another in accordance with a predetermined ratio and the m-bits are equal to one another and repetitive of selected lower order n-bits of the (n+m)-bit digital word; and

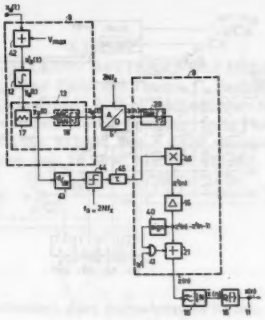
(n+m)-bit digital-to-analog converter means having stable but imprecise component values for generating an analog signal in response to the (n+m)-bit digital word output from said storage array means, said analog signal having a value equivalent to the value of said received n-bit digital word and where said n and m bits of said (n+m)-bit digital words stored in said storage array means are selected to correct the generated analog signal for said imprecise component values.

4,318,086

(B+A)-BIT-A/D CONVERTOR WITH B-BIT AUXILIARY A/D CONVERTOR

Johannes B. H. Peek; Wolfgang F. G. Mecklenbräuker; Theodoor A. C. M. Claasen, and Nicolaas van Hurck, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 26, 1979, Ser. No. 88,736
Claims priority, application Netherlands, Nov. 30, 1978, 7811731
Int. Cl.³ H03K *13/02*
U.S. Cl. 340—347 AD **6 Claims**



1. An analog-to-digital converter for converting an analog signal whose frequency spectrum is located in a certain signal frequency band, into a sequence of code words each comprising b+a bits, characterized in that this analog-to-digital converter comprises:

(a) an input for receiving said analog signal;

(b) integration and amplitude-limiting means for generating an auxiliary signal which is an amplitude-limited version of the integrated signal applied to these means;

(c) means for coupling the input of the integration and amplitude-limiting means to said analog signal input;

(d) an auxiliary analog-to-digital converter to which said auxiliary signal is applied and which is arranged for converting this auxiliary signal into a sequence of code words each comprising b bits; sampling pulses which occur with a sampling frequency greater than the Nyquist sampling frequency of the analog signal being applied to this auxiliary analog-to-digital converter;

(e) a cascade arrangement of a digital difference network and digital amplitude-restoration means, the cascade arrangement being connected to the output of the auxiliary analog-to-digital converter;

(f) a digital filter coupled to the output of the cascade arrangement and arranged for suppressing the frequency components located outside the signal frequency band and for supplying said (b+a)-bit code words.

4,318,087

SWITCH CLOSURE SENSING CIRCUIT

Robert E. Wilson, Whitehouse Station, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 8, 1980, Ser. No. 184,952
Int. Cl.³ G06F *3/02*
U.S. Cl. 340—365 S **10 Claims**

1. The combination comprising:

first and second power terminals for the application therebetween of an operating potential;

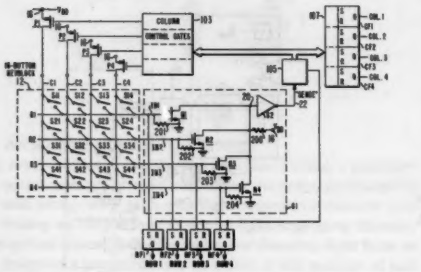
a matrix array of conductors comprising N column conductors and M row conductors, where N and M are integers greater than 1;

a normally open, switch at the intersection of each row and column conductor; each switch, when closed, making a

connection between its corresponding row and column conductors;

N transistors and M transistors, each one of said N and M transistor having a control electrode and first and second electrodes defining the ends of its conduction path,

there being one of said N transistors per column conductor, each of said N transistors having its conduction path connected between its column conductor and said first power terminal, and there being one of said M transistor per row conductor, each one of said M transistors having its control electrode connected to its row conductor and



one end of its conduction path connected to said second power terminal; and

pulse generating means coupled between the second electrodes of said M transistors and the control electrodes of said N transistors for, in response to a switch closure, producing scanning pulses which are sequentially applied to the control electrodes of said N transistors of a polarity to turn them on sequentially, each for a scans pulse duration, only that one of said N transistors whose conduction path is connected via a closed switch to a row conductor being rendered conductive and producing a signal indicating that a switch in the associated column is closed.

4,318,088

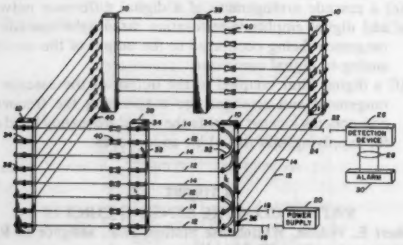
SECURITY FENCE SYSTEM

Kent Hunter, R.R. #1, Frost Mill Rd., Mill Neck, N.Y. 11765

Filed Nov. 23, 1979, Ser. No. 97,006

Int. Cl.³ G08B *13/22*

U.S. Cl. 340—541 **12 Claims**



1. A security fence comprising:

a plurality of posts vertically arranged in the earth in a spaced-apart relationship and defining the area to be fenced;

two wires arranged in a spaced-apart pair consecutively affixed to each of said plurality of posts and being directionally reversed in a predetermined manner at the last of said plurality of posts and continuing in such fashion until the top of the last post is reached, said two wires being electrically continuous and said predetermined manner being such that unlike wires are adjacent one another, the wires being arranged on the post such that the vertical distance between the wires in relation to the distance between the posts is such that upon exerting mechanical force on the wires unlike wires will be brought into contact with one another;

said plurality of posts being arranged such that there are intermediate posts located between end posts which define said area to be fenced, and wherein said wires are firmly affixed to said end posts such that no relative motion between the wires and the end posts is possible and the wires are affixed to said intermediate posts such that said wires are permitted to slip horizontally in relation to said intermediate posts;

said wires being affixed to said intermediate posts by affixing means comprising a staple enclosing a nonconducting insert having an aperture therein of diameter substantially larger than the diameter of said wires;

power supply means connected to said two wires for supplying a voltage across the wires;

detection means connected to the opposite ends of said two wires for detecting when the current flowing through said two wires deviates from a preselected value; and

alarm means connected to said detection means for providing an alarm when said deviation from said preselected value is detected by said detection means.

4,318,089

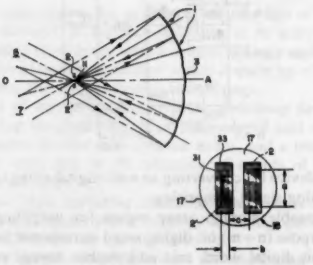
INFRARED DETECTOR SYSTEM

Denes E. Frankel, Los Angeles; Robert C. Dobkin, Hillsboro, and Barry G. Broome, Glendora, all of Calif., assignors to David Frankel, Lynwood, Calif.

Filed Mar. 24, 1980, Ser. No. 133,353

Int. Cl.³ G01J *5/08;* G08B *13/18*

U.S. Cl. 340—567 **19 Claims**



1. An infrared detector system comprising;

at least a pair of spaced apart infrared sensing elements capable of generating respective first and second electrical signals;

a plurality of reflective surfaces subtending respective different object fields of view, about a respective optical axis, each reflective surface having a focal point positioned on its optical axis between the respective infrared sensing elements and reflecting optimum energy resolution of an image configuration compatible to the sensing element configuration whereby movement of an infrared emitting object will produce a sequence of electrical signals from the infrared sensing elements; and

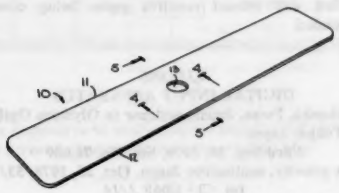
means for processing the electrical signals to produce an alarm signal in response to predetermined enabling conditions.

4,318,090

APPARATUS FOR DEACTIVATING A SURVEILLANCE TAG

Douglas A. Narlow, Coral Springs, and Eugene Stevens, Pembroke Pines, both of Fla., assignors to Sensormatic Electronics Corporation, Deerfield Beach, Fla.

Filed Oct. 27, 1980, Ser. No. 201,050
Int. Cl.[3] G08B 13/24
U.S. Cl. 340—572 12 Claims



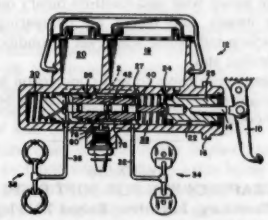
1. Apparatus for deactivating a surveillance tag, the detection of which by an interrogation station is dependent upon the condition of a semiconductor diode contained in said tag which diode is connected conductively to a first pair of contacts exposed adjacent at least one surface of said tag, said apparatus comprising a probe constructed to be brought into engagement with said one surface and moved relative thereto, said probe including a second pair of contacts that ride along said one surface during said movement of said probe so as to engage conductively said first pair of contacts, and means coupled to said second pair of contacts for furnishing thereto alternating current sufficient to deteriorate said diode during the interval of said conductive engagement such that said tag is no longer detectable by said interrogation station.

4,318,091

SELF-RESETTING WARNING ACTUATOR FOR A DUAL CIRCUIT BRAKE SYSTEM

Keith H. Fulmer, Mishawaka, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Sep. 2, 1980, Ser. No. 183,478
Int. Cl.[3] G08B 21/00
U.S. Cl. 340—626 7 Claims



1. A self resetting warning actuator comprising:

a housing defining a bore therein, said housing further defining a recess on said bore and an axially-extending ramp between said recess and said bore;

a pair of pressure responsive piston means slidably received in said bore for cooperating with said housing to define a pair of pressure chambers, said piston means moving from a neutral position to a failed position responsive to a pressure differential between said pressure chambers, each of said piston means having an inner end contiguous to the other piston means;

a roller member engaging the inner ends of said piston means, said roller member moving between a first location in which said roller member is received in said recess and cooperates with said pair of piston means to define said neutral position, and said roller member moving to a second location responsive to movement of said piston means to said failed position, said roller member in said second locatior. being spaced from said recess and moving radially inwardly on said ramp and between said pair of piston means; and

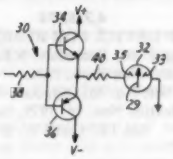
means responsive to the movement of said piston means to the failed position for providing a signal.

4,318,092

MEANS FOR CHECKING BATTERY VOLTAGE LEVEL

Arthur L. Cowles, River Falls, and Thomas C. Ensign, Hudson Township, St. Croix County, both of Wis., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation of Ser. No. 913,598, Jun. 8, 1978, abandoned. This application Jan. 25, 1980, Ser. No. 115,340
Int. Cl.[3] G08B 21/00
U.S. Cl. 340—636 6 Claims



1. Apparatus for determining whether a battery is in a replacement condition including an operational amplifier powered from the battery and indicating means operatively connected to the output of the operational amplifier, said operational amplifer having an input for signals obtained independent of the battery, said operational amplifier requiring a signal of one polarity at said input for operation of said indicating means, said indicating means providing a perceptible response when an input signal of said one polarity is applied to said input, said perceptible response including a replace battery indication which is provided when the voltage of the battery is less than a predetermined level and a saturation signal of said one polarity and independent of the battery is then applied to said input of said operational amplifier.

4,318,093

LOGIC CIRCUIT MONITOR

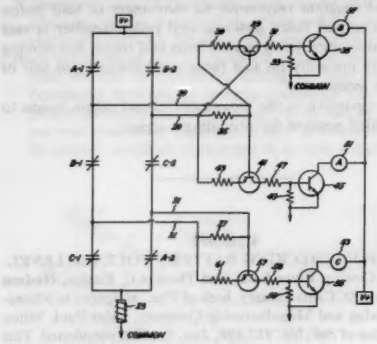
Robert J. Wood, Ballston Spa, and John F. Mitchell, Latham, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 25, 1980, Ser. No. 124,325
Int. Cl.[3] G08B 21/00
U.S. Cl. 340—644 15 Claims

1. In combination with a multiply redundant switching network providing protective control, and wherein such switching network includes at least one shunt current path to carry at least a portion of a switched load current in the event of a malfunction or test within said switching network, a monitor for indicating loss of redundancy within said switching network, comprising:

means for sensing shunt current flow to produce a signal indicative of such current flow, there being one sensing means for each shunt current path; and

means responsive to said current signal to cause a particular indication of that portion of said switching network which is



malufunctioning or under test, there being at least one such signal responsive means for each shunt current path.

4,318,094

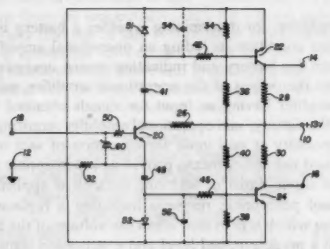
INTERFACE DEVICE FOR REMOTE CONTROL

William L. Ferrigno, Jr., Peacedale, R.I., assignor to General Electric Company, New York, N.Y.

Continuation of Ser. No. 701,061, Jun. 30, 1976, abandoned. This application Nov. 16, 1979, Ser. No. 95,118

Int. Cl.³ G08B *21/00*

U.S. Cl. 340—657 **8 Claims**



1. An interface device for converting interruption of a continuous electrical signal into a momentary first electrical signal and converting initiation of a continuous electrical signal into a momentary second electrical signal thus indicating, respectively, a change from presence or from absence of said continuous signal, which includes:

means for sensing the initiation and interruption of a continuous signal;

said change sensing means including:

an NPN sensing transistor, having a collector terminal connected through a first resistor to a positive D.C. voltage supply, an emitter terminal connected through a second resistor to ground, and a base terminal connected to receive a positive base terminal control signal to indicate said continuous electrical signal and to maintain said sensing transistor to its conducting state;

means for providing a first momentary indication when the continuous control signal is initiated, and a second momentary indication when the continuous signal ceases;

a first means for responding to said first momentary indication to provide a first momentary electrical signal;

a second means for responding to said second momentary indication to provide a second momentary electrical signal;

means for supplying said continuous electrical signal to said base as a base control signal;

a first capacitor, having a first side connected to the collector terminal of said NPN sensing transistor, and a second opposite side connected through a first resistive path to ground;

a second capacitor, having a first side connected to the emitter terminal of said NPN sensing transistor, and a second opposite side connected through a second resistive path to ground; and

said first and second resistive paths being commonly grounded.

4,318,095

DIGITAL INPUT APPARATUS

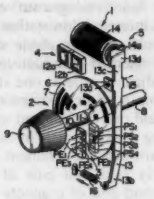
Kenji Fukuoka, Fussa, Japan, assignor to Olympus Optical Co. Ltd., Tokyo, Japan

Filed Sep. 24, 1979, Ser. No. 78,609

Claims priority, application Japan, Oct. 25, 1978, 53/131341

Int. Cl.³ G06F *3/14*

U.S. Cl. 340—706 **17 Claims**



1. Switch apparatus, comprising:

encoder means having a code pattern thereon defining a plurality of digital codes which are a function of locations on said encoder means at which said code pattern is read;

reader means for scanning selected locations on said encoder means and for producing a multi-bit binary output from the portion of said code pattern read therefrom;

display means for receiving said multi-bit binary output to cause a representation thereof to be displayed;

storage means for storing positional information corresponding to selectable positions of said switch apparatus;

means for comparing positional information stored in said storage means with said multi-bit binary output from said reader means, said means for comparing producing a comparison indication whenever a condition of comparison obtains; and

brake means responsive to said comparison indication from said means for comparing for applying a braking force to said encoder means.

4,318,096

GRAPHICS PEN FOR SOFT DISPLAYS

David D. Thornburg, Los Altos; Robert M. Flegal, Palo Alto, and Tat C. Lam, Fremont, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed May 19, 1980, Ser. No. 150,773

Int. Cl.³ G09G *1/00*

U.S. Cl. 340—706 **9 Claims**

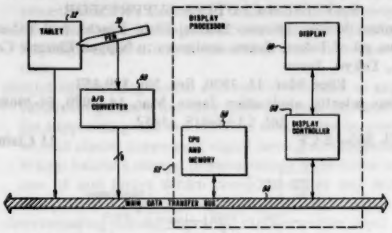
1. A graphics input device for use with location indicating means to present graphic data upon a computer controlled visual display characterized by including,

a pen housing,

a conductive stylus shaft secured within said housing having one end extending beyond said housing to act as a writing tip for generating a position signal,

circumferential off-axis pressure responsive electrode means surrounding a portion of said stylus shaft for generating a variable output non-position signal in response to variable

off-axis forces at any circumferential location on said stylus shaft, and



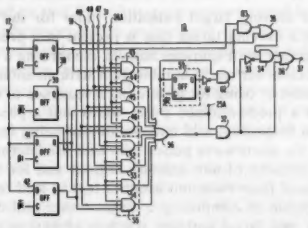
means responsive to said variable output signal for modifying a visual characteristic of the graphic data.

4,318,097

DISPLAY APPARATUS FOR DISPLAYING A PATTERN HAVING A SLANT PORTION

Toshio Oura, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Mar. 15, 1979, Ser. No. 20,789
Claims priority, application Japan, Mar. 15, 1978, 53-30202
Int. Cl.³ G09G *1/14*
U.S. Cl. 340—728 **10 Claims**



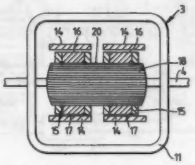
1. A pattern display system comprising: first memory means for storing pattern information representing a plurality of rectangular picture elements of a pattern to be displayed; second memory means for storing conversion information; means for generating timing signals; display means which operate in synchronism with the timing signals; means for deriving a display signal representing said rectangular picture elements from said first memory means in synchronism with the timing signals, each of said rectangular picture elements being displayed over plural units of continuous display areas of said display means, each unit of said display areas being energized in response to each of the timing signals applied to said display means; means for deriving a conversion signal from said second memory means in synchronism with the timing signals; a plurality of digital delay means operatively storing the display signal corresponding to one of said rectangular picture elements and generating delayed signals with different phases from each other over the period that said plural units of continuous display areas are energized, first means responsive to said conversion signal for sequentially deriving said delayed signals in a first order so as to represent a first approximated parallelogram picture element; and second means responsive to said conversion signal for sequentially deriving said delayed signals in a second order, the reverse of said first order, so as to represent a second approximated parallelogram picture element having a different slope from said first approximated parallelogram picture element.

4,318,098

SIGNS

Roy McGreevy, c/o Post Office, Silverdale, New Zealand

Filed Dec. 10, 1979, Ser. No. 101,796
Claims priority, application New Zealand, Dec. 8, 1978, 189130
Int. Cl.³ G09G *3/16*
U.S. Cl. 340—764 **10 Claims**



1. A sign comprising:

at least one character forming member formed of an array of housings;

each said housing having at least two different exterior visual appearance portions;

each said housing having therein a space having a longitudinal axis;

a stationary mounting member having parts thereof positioned within said space, said housing being mounted about said parts of said stationary mounting member for rotation about an axis thereof coincident with said longitudinal axis;

said housing having therein permanent magnets rotatable with said housing about said axis and having opposite north pole and south pole magnetized faces generating therebetween a permanent magnetic field;

said stationary mounting member carrying reversible magnetic filed generating means for generating a reversible magnetic field and forming reversible north pole and south pole faces presented to said magnetized faces of said permanent magnets, and for, upon reversal of said magnetic field, causing said permanent magnets and said housing to rotate about said axis to thereby display a given said appearance portion;

said reversible magnetic field generating means being substantially physically contained within said housing and within said permanent magnetic field between said permanent magnets; and

selection means operably connected to said reversible magnetic field generating means for selectively rotating desired said housings to achieve a desired visual display of said array of housings.

4,318,099

CLUTTER FILTER USING A MINIMUM NUMBER OF RADAR PULSES

James K. Hsiao, Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 21, 1980, Ser. No. 123,338
Int. Cl.³ G01S *13/52*
U.S. Cl. 343—5 SW **5 Claims**

1. A clutter filter using a minimum number of radar pulses, comprising:

input means for receiving a series of phase-detected radar returns in digital form, the radar returns having a fixed interpulse time period;

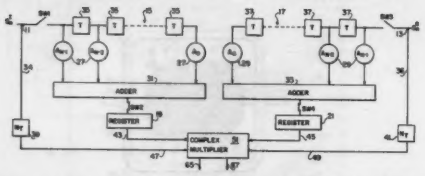
canceling means for weighting and summing N of the phase-detected radar returns to cancel clutter signals, where N is an integer;

store means;

first switching means for connecting the canceling means to the input means during receipt of the N returns and dis-

connecting the canceling means from the input means thereafter;

second switching means for disconnecting the canceling means from the store means during receipt of the N returns and connecting the canceling means to the store means for an interval less than the interpulse time period thereafter;



first delay means coupled to the input means for introducing a delay equal to N interpulse time periods to each of the phase-detected radar returns; and

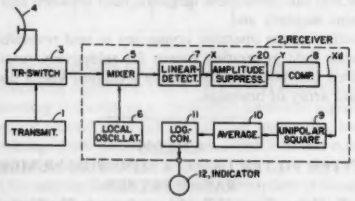
a complex multiplier connected to the store means and to the first delay means for generating more than N filtered outputs with (N−1) less pulses than required by an N-pulse canceler.

4,318,100

AUTOMATIC GROUND CLUTTER REJECTION IN WEATHER PULSE RADAR SYSTEM

Toshio Shimizu; Atsushi Wakabayashi, and Shuichi Goto, all of Mitaka, Japan, assignors to Japan Radio Company, Limited, Tokyo, Japan

Filed Feb. 19, 1980, Ser. No. 122,498
Claims priority, application Japan, Feb. 20, 1979, 54-18876
Int. Cl.[3] G01S *13/95*
U.S. Cl. 343—5 W **13 Claims**



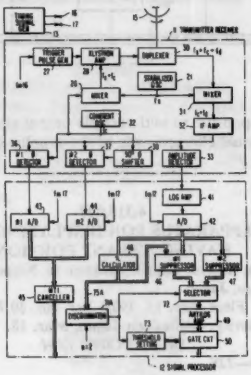
1. In a method for obtaining rain information from the mean power of the weather echo signal in a weather pulse radar system, which comprises steps of obtaining echo signals by detection of received waves in the radar system, comparing each one of successive echo signals with another later one which is spaced apart from the each one echo signal by a time period that the fluctuation of weather echo signals is independent to generate amplitude-difference signals, measuring the variance of the amplitude-difference signals, and calculating the mean power of the weather echo signal from the variance, the improvement comprising non-linearly amplitude suppressing the echo signals before the comparing step to more suppress echo signals of the greater amplitude, whereby the residual ground clutter in the amplitude-difference signals may be reduced.

4,318,101

MTI RADAR COMPRISING A PROCESSOR SELECTIVELY OPERABLE AS A WEIBULL AND A RAYLEIGH CLUTTER SUPPRESSOR

Toshimitsu Musha; Matsuo Sekine; Eichi Kiuchi, and Takeru Irabu, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Mar. 11, 1980, Ser. No. 129,457
Claims priority, application Japan, Mar. 14, 1979, 54-29686
Int. Cl.[3] G01S *13/52*
U.S. Cl. 343—5 CF **11 Claims**



1. In a moving target indication radar for use at least in detecting a moving target that is present in a predetermined space together with spurious objects, comprising a transmitter and a receiver for use in combination with an antenna device, said transmitter being for generating a sequence of microwave pulses of a predetermined pulse width and a predetermined repetition frequency, said antenna device being for making a beam of the microwave pulses scan said predetermined space along a plurality of unit azimuth regions and for receiving a return signal from each unit azimuth region, said return signal being capable of comprising a target return and clutter produced by said target and said spurious objects in response to one of the microwave pulses of said beam, respectively, said clutter having a clutter amplitude that follows one of Weibull and Rayleigh distributions at a time, said Weibull distribution being given by a probability density function of said clutter amplitude by the use of a first and a second parameter having values variable with time, said Rayleigh distribution being given by another probability density function of said clutter amplitude by the use of said first parameter alone with said second parameter given an invariant value equal to two, said receiver comprising means responsive to said return signal for producing a detected signal and a signal processor for processing said detected signal into a processed signal for use at least in detecting said target, said detected signal having an envelope, said envelope having an envelope amplitude variable with time in response to a target return component and a clutter component introduced into said envelope amplitude from said target return and said clutter, respectively, the improvement wherein said signal processor comprises:

parameter calculating means responsive to said detected signal for calculating the value of said second parameter to produce a parameter signal representative of the calculated second parameter value;

first suppressing means operatively coupled to said parameter calculating means and responsive to said detected signal for suppressing that first-kind component of said clutter component by the use of said parameter signal, which is introduced into said envelope amplitude from the clutter having a clutter amplitude following said Weibull distribution, to produce a first clutter suppressed signal

having an amplitude that is kept below a first predetermined level unless at least one of said target return component and that second-kind component of said clutter component, which is introduced into said envelope amplitude from the clutter having a clutter amplitude following said Rayleigh distribution, is present in said envelope amplitude;

second suppressing means operatively coupled to said first suppressing means and responsive to said detected signal for suppressing said second-kind component to produce a second clutter suppressed signal having an amplitude that is kept below a second predetermined level unless at least one of said target return component and said first-kind component is present in said envelope amplitude;

discriminating means responsive to a variable input signal variable in compliance with that one of said Weibull and said Rayleigh distributions, which said clutter amplitude follows at each instant, for discriminating said one distribution from the other to produce a discrimination signal at a particular instant a predetermined interval of time after said each instant, said discrimination signal being indicative of said Weibull and said Rayleigh distributions when said Weibull and said Rayleigh distributions are discriminated to be followed by said clutter amplitude, respectively;

selecting means coupled to said first and said second suppressing means and responsive to said discrimination signal for selecting said first and said second clutter suppressed signals when said discrimination signal indicates said Weibull and said Rayleigh distributions, respectively, said selecting means thereby producing a selected signal having an amplitude that is kept below a first preselected level when said first clutter suppressed signal is selected and furthermore unless at least one of said target return component and said second-kind component is present in said envelope amplitude and below a second preselected level when said second clutter suppressed signal is selected and furthermore unless at least one of said target return component and said first-kind component is present in said envelope amplitude;

a connection between said discriminating means and a predetermined one of said parameter calculating means and said selecting means for supplying said discriminating means with one of said parameter signal and said selected signal as said variable input signal that is produced by the predetermined one of said parameter calculating means and said selecting means; and

final processing means responsive to said discrimination signal for processing said selected signal into said processed signal.

4,318,102
INTRUSION DETECTION SYSTEM HAVING LOOK-UP SENSOR INSTRUMENTATION FOR INTRUSION RANGE AND ALTITUDE MEASUREMENTS

Joseph L. Poirier, Chelmsford, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

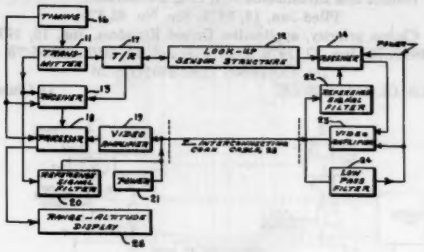
Filed Apr. 15, 1980, Ser. No. 140,551
Int. Cl.³ G01S *13/08*
U.S. Cl. 343—12 A **5 Claims**

3. An intruder detection system comprising

a look-up sensor encompassing an area to be protected comprised of a leaky transmission line for radiating r.f. energy in an upwards direction along its length,

a transmitter for transmitting r.f. energy

first and second r.f. receivers, said transmitter and said first r.f. receiver being connected to one end of said look-up sensor and said second r.f. receiver being connected to the other end, said transmitter and said first r.f. receiver constituting a monostatic radar and said transmitter and said second r.f. receiver constituting a bistatic radar, said look-up sensor constituting transmitting and receiving antenna means for both monostatic and bistatic radars, and

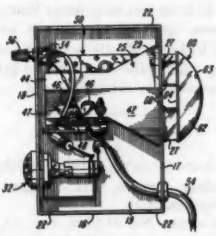


processor means receiving the received signals from said first and second r.f. receivers and generating intrusion incident range and altitude data therefrom.

4,318,103
COMPACT RADAR DETECTOR AND RANGE EXTENDER

Donald L. Roettele, and William E. Yohpe, both of Dayton, Ohio, assignors to ComGeneral Corporation, Dayton, Ohio

Filed Mar. 17, 1980, Ser. No. 130,722
Int. Cl.³ H01Q *19/06*; G01S *7/36*
U.S. Cl. 343—18 E **3 Claims**

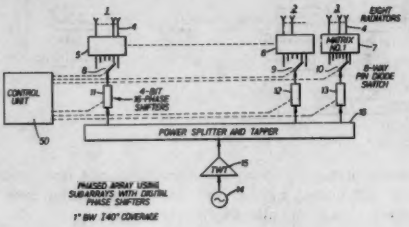


1. In a compact radar detector unit for detecting radar signals, said detector unit including a housing, a compact horn antenna disposed within said housing and having converging walls defining a tapered cavity, said housing having a front wall defining an aperture aligned with said cavity, said antenna including means for detecting radar signals received within said cavity, an alarm disposed within said housing, and circuit means for actuating said alarm in response to a predetermined signal received by said detecting means, the improvement comprising a dielectric lens member covering said aperture and said cavity, said lens member having a plurality of legs spaced to engage said front wall of said housing outwardly of said aperture, pressure sensitive adhesive for attaching said legs to said front wall of said housing, and said lens member having a surface effective to introduce a microwave phase delay decreasing generally from the center of said cavity towards said converging walls of said horn antenna to compensate for the compactness of said horn antenna and for significantly incresing the sensitivity of said detector.

4,318,104
DIRECTIONAL ARRAYS

Mohamed H. Enein, Woking, England, assignor to Plessey Handel und Investments AG, Zug, Switzerland

Filed Jun. 14, 1979, Ser. No. 48,379
Claims priority, application United Kingdom, Jun. 15, 1978, 26990/78; Jun. 22, 1978, 27647/78; Jul. 14, 1978, 29946/78
Int. Cl.[3] H04B 7/00; H01Q 3/26
U.S. Cl. 343—100 LE **11 Claims**



1. A beam steering or scanning system for generating a scanned spacial directional beam, comprising:

a plurality of radiating elements connected in groups;

main array beam former means for providing signals for each group and for forming a main array radiation pattern characterized by an array factor including the scanned beam and associated grating lobes; and

sub-array beam former means for providing a sub-array beam factor including nulls at similar spacing to the grating lobes;

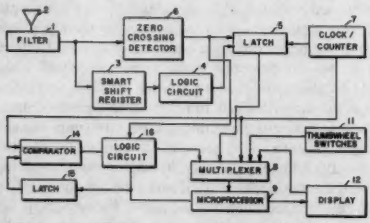
wherein said array beam former means and said sub-array beam former means are controlled contemporaneously so as to modify said sub-array factor contemporaneously with said array factor;

said sub-array beam former means including a plurality of beam forming networks, one for each group of elements, and a plurality of switches, one for each network, for feeding said networks from said main array beam former means, said switches being operated sequentially so that the nulls are constrained to be substantially coincident with the grating lobes during each scan, whereby said grating lobes appearing in said main array are suppressed.

4,318,105
LORAN-C NAVIGATION APPARATUS

Lester R. Brodeur, Nashua, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Continuation of Ser. No. 842,706, Oct. 17, 1977, abandoned. This application Mar. 22, 1979, Ser. No. 22,661
Int. Cl.[3] G01S 1/24
U.S. Cl. 343—103 **17 Claims**



1. A navigation receiver-indicator providing navigation information by receiving and measuring differences in the time of arrival of coded radio signals received from a plurality of navigation transmitters, in groups of transmitters, comprising:

means for selecting a group of transmitters to be used for said time difference of arrival measurements,

first logic means processing said radio signals as they are received for determining when received signals are properly coded indicating they are from said navigation transmitters,

and providing output indications of same,

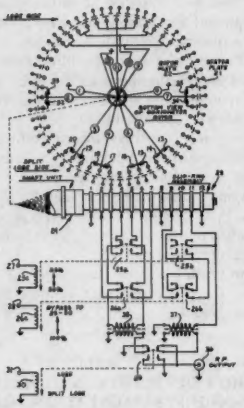
processor means storing and analyzing said output indications from said first logic means to determine when received radio signals are from transmitters of a group of transmitters selected using said selecting means, and

second logic means enabled by and functioning with said processor means after said processor means has determined that received radio signals are from said selected group of transmitters to calculate the time of reception of subsequently received radio signals and then to analyze said last-mentioned radio signals to thereby locate a specific point of said last-mentioned radio signals used by said processor means to accurately measure the difference in time arrival of said radio signals from individual transmitters of said selected group of transmitters and provide a visual output of said measurements to provide navigation information.

4,318,106
DIRECTION FINDING SYSTEM

Arthur Luedtke, Marietta, Ga., assignor to The United States of America as represented by the Field Operations Bureau of the FCC, Washington, D.C.

Filed Mar. 20, 1980, Ser. No. 132,027
Int. Cl.[3] G01S 5/04
U.S. Cl. 343—124 **15 Claims**



1. An automatic variable aperture direction finder comprising:

a wideband circularly disposed array of antennas connected to a goniometer;

said antennas operated without a reflector screen providing multi-octave frequency coverage and diversity reception capability;

means for phase comparison of selected antennas to produce Lobe and Split-lobe patterns without the use of delay lines;

means for varying the effective aperture of said antenna array through selection of rotor plate signals;

means for receiving, detecting, and displaying said signal pattern;

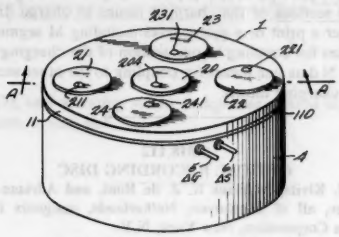
means for displaying the signal patterns in bearing form;

and means for controlling said goniometer.

4,318,107
PRINTED MONOPULSE PRIMARY SOURCE FOR AIRPORT RADAR ANTENNA AND ANTENNA COMPRISING SUCH A SOURCE

Robert Pierrot; Francois Gautier, and Pierre Crochet, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Nov. 20, 1979, Ser. No. 96,148
Claims priority, application France, Nov. 24, 1978, 78 33292
Int. Cl.[3] H01Q *1/38, 19/12, 25/04*
U.S. Cl. 343—700 MS 19 Claims



1. A monopulse primary source comprising:

a microstrip radiating circuit comprising:

a dielectric material substrate having first and second faces;

a conductive coating provided on said first face for forming a reference ground plane;

a central microstrip radiating element provided on said second face for forming a sum channel;

at least one pair of radiating elements, provided on said second face and being symmetrical with respect to the central radiating element for supplying, on reception, signals which are 180° out of phase for forming one difference channel;

each radiating element having a feedpoint associated therewith, the feedpoint having a predetermined eccentricity with respect to the zero field radio center of its respective radiating element in the axis of polarization defined by the eccentricity of the feedpoint of the central radiating element;

a feeding/receiving circuit; and

connecting means for coupling the feedpoints of said radiating elements to said feeding/receiving circuit.

4,318,108
BIDIRECTIONALLY FOCUSING ANTENNA

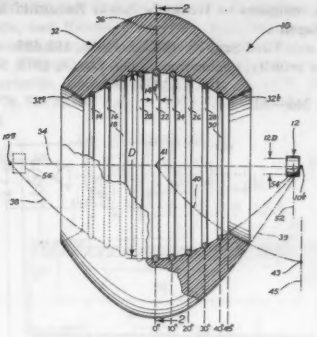
Tex N. Yukl, Banks, Oreg., assignor to Near Field Technology Co., Portland, Oreg.

Continuation of Ser. No. 792,527, May 2, 1977, abandoned. This application Dec. 18, 1978, Ser. No. 970,378
Int. Cl.[3] H01Q *15/00;* G01R *27/04*
U.S. Cl. 343—753 28 Claims

1. A bidirectional focusing antenna for radiating electromagnetic energy of a selected wavelength simultaneously in opposite directions along the antenna's axis, said antenna comprising

means defining a central, generally planar endless-ring-type conductive expanse having a nominal circumference substantially equaling said selected wavelength, with the plane of said expanse defining the central plane of the antenna, and being disposed normal to said axis, and

bidirectional focusing means, including electromagnetic/electrostatic shield means in the form of an annular conductive layer symmetrical with respect to said axis, positioned adjacent, and symmetrically with respect to, opposite sides of said plane for creating on said opposite sides, and on said

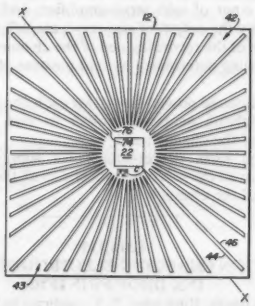


axis, a pair of symmetrically spaced point-foci with respect to said expanse.

4,318,109
PLANAR ANTENNA WITH TIGHTLY WOUND FOLDED SECTIONS

Paul Weathers, c/o T.V. Antenna, Specialists, Inc., 1013 Lake Shore Dr., Collingswood, N.J. 08108

Filed May 5, 1978, Ser. No. 903,056
Int. Cl.[3] H01Q *1/38*
U.S. Cl. 343—806 2 Claims



1. A broad-band receiving antenna system comprising antenna means and transmission means for coupling said antenna means to a load, said antenna means comprising a multi-resonant, substantially non-radiating, electrically symmetrical receptor responsive to signals in the VHF and UHF broadcast bands, said receptor comprising:

(a) A pair of radially disposed elements comprising a plurality of series connected tightly folded conductive members disposed in a circular array about a common center, each of said folded conductive members comprising a pair of parallel conductors having first ends spaced from one another by not more than 0.02 inches, means electrically connecting the ends of said parallel conductors opposite said first ends and,

(b) conductive means for electrically connecting each folded conductive member to an adjacent folded conductive member.

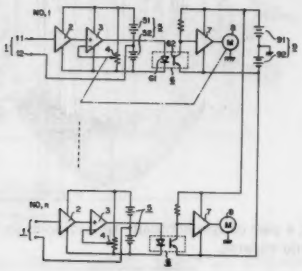
(c) said pair of radially disposed elements disposed on a nonconductive base and,

(d) coupling means for electrically connecting said radially disposed elements to said transmission means.

4,318,110
MULTI-CHANNEL RECORDING INSTRUMENT

Kinzo Iino; Ken-Ichiro Ohta, and Hiroshi Aibe, all of Tokyo, Japan, assignors to Watanabe Sokki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 19, 1980, Ser. No. 188,689
Claims priority, application Japan, Oct. 4, 1979, 54/128253
Int. Cl.[3] G01D *9/00*
U.S. Cl. 346—32 2 Claims



1. Multi-channel recording instrument comprising:

one each channel equipment for each channel, said channel equipment including a reference signal input means, an error detector means to generate an error signal as the difference between the reference signal and a feedback signal of the channel, a servo-amplifier to amplify said error signal, a photo-coupler for transmitting said error signal from the output of said error signal detector means to the input of said servo-amplifier, and a servo-motor driven by the output of said servo-amplifier to control the position of the recording pen of the channel, said feedback signal being determined by said position of said recording pen;

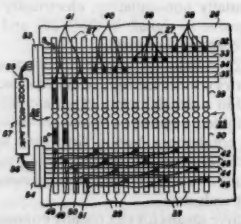
one each isolated power-supply for each channel equipment, for supplying necessary power to said error detector means of the channel; and

a common main power-supply for supplying necessary power to all the servo-motors and to all the servo-amplifiers of all the channels.

4,318,111
TWO SECTION CHARGING ELECTRODES FOR BINARY INK DROP PRINTERS

David E. Damouth, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 3, 1980, Ser. No. 193,558
Int. Cl.[3] G01D *15/18*
U.S. Cl. 346—75 9 Claims



1. Binary ink drop printing apparatus comprising

a drop generator including M×N number of nozzles for emitting under pressure continuous streams of liquid from which ink drops are formed toward a target to be printed,

drop deflection means for electrostatically deflecting charged drops with print drops following a trajectory to a target and gutter drops following a trajectory to a gutter means,

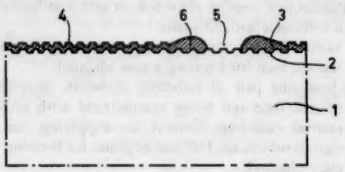
M×N number of two section, drop charging means located at the region at which drops are created from a stream for charging print drops to a print level permitting them to reach a target for printing and for charging gutter drops to a gutter level permitting them to be collected by gutter means and

matrix means for coupling print and gutter voltages to the two sections of the charging means to charge drops to either a print or a gutter level including M segment line means for coupling to one section of the charging means and N data line means for coupling to the other section of the charging means.

4,318,112
OPTICAL RECORDING DISC

Petrus J. Kivits; Marinus R. J. de Bont, and Adriaan W. de Poorter, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 29, 1979, Ser. No. 98,436
Claims priority, application Netherlands, Sep. 10, 1979, 7906728
Int. Cl.[3] G01D *15/34*
U.S. Cl. 346—135.1 8 Claims



1. An optical recording device in which information can be recorded and read optically comprising a substrate having on at least one side an ablative recording layer which upon exposure to energy-rich light modulated according to the information melts in exposed places and forms holes characterized in that at the surface of the substrate facing the recording layer there is present a surface discontinuity having a diametrical dimension of 30 to 300 nm and a level difference with the substrate surface of 8 to 80 nm, the recording layer having a thickness in the order of magnitude of 30–40 nm.

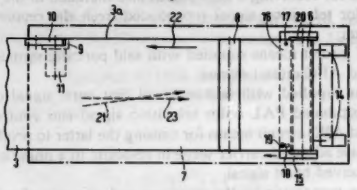
4,318,113
PAPER CONVEYING DEVICE FOR A RECORDING UNIT

Bengt Skafvenstedt, Stockholm, and Sture Ahlgren, Vällingby, both of Sweden, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 15, 1980, Ser. No. 122,073
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1979, 2910019
Int. Cl.[3] G01D *15/24;* B65H *25/26*
U.S. Cl. 346—136 4 Claims

1. A paper conveying device for a recording unit with a support mount for the blank paper, with rollers for the guidance and the conveying of the writing paper along a paper conveying path and defining a longitudinal feed axis, and with a recorder which writes essentially perpendicular to the longitudinal feed axis and with at least one deflection roller in the paper conveying path over which the paper is conducted during supply of the paper in a longitudinal direction of the paper, the at least one deflection roller (6) being rotatably mounted for angular movement approximately in the longitudinal direction of the paper, characterized in that the deflection roller (6) has a bow (15) including a base plate (16) which is

rotatably mounted for angular movement about a rotational axis (17) and provides a slot (18) curved about the rotational



axis (17), said arresting means comprising a fixed screw (19) engagable in said slot.

4,318,114

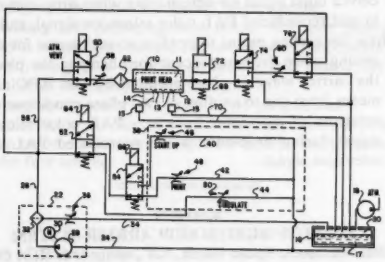
INK JET PRINTER HAVING CONTINUOUS RECIRCULATION DURING SHUT DOWN

David A. Huliba, Kettering, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Sep. 15, 1980, Ser. No. 187,003

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—140 R **9 Claims**



1. An ink jet printer, comprising:

a print head including a fluid receiving reservoir, and an orifice plate defining at least one orifice communicating with said reservoir for providing ink flow through said orifice to form a jet drop stream for printing,

fluid supply means, including an ink supply tank, and pump means connected to said ink supply tank,

print head supply line means for providing flow of ink from said fluid supply means to said fluid receiving reservoir of said print head,

print head return line means for returning ink from said fluid receiving reservoir of said print head to said fluid supply means, and

control means for controlling the flow of ink supplied to said print head by said fluid supply means to provide a flow of ink at a predetermined flow rate during printing and to provide a substantially reduced continuous flow of ink from said print head supply line means to said print head return line means through said reservoir at substantially reduced fluid pressure during periods in which said printer is shut down and a jet drop stream is not produced by said print head, whereby ink is continuously circulated through said print head without weeping of ink through said orifice, drying of ink adjacent said orifice or deposit of contaminants within said reservoir.

4,318,115

DUAL JUNCTION PHOTOELECTRIC SEMICONDUCTOR DEVICE

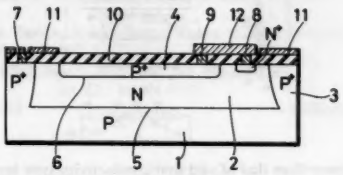
Toshihumi Yoshikawa, Nara; Zempei Tani, Tondabayashi; Akira Aso, Nara, and Hitoshi Kawanabe, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 24, 1979, Ser. No. 60,188

Claims priority, application Japan, Jul. 24, 1978, 53/90667; Jul. 27, 1978, 53/92390; Aug. 15, 1978, 53/99686; Sep. 28, 1978, 53/120214

Int. Cl.³ H01L *27/14*

U.S. Cl. 357—30 **11 Claims**



1. A photoelectric semiconductor device comprising:

a semiconductor substrate of a first conductivity type;

a first impurity region of a second conductivity type opposite to the first conductivity type formed in said semiconductor substrate;

a first PN junction formed between said semiconductor substrate and said first impurity region;

a second impurity region of the first conductivity type shallowly formed in said first impurity region;

a second PN junction formed between said first impurity region and said second impurity region;

a first output electrode connected to said semiconductor substrate;

a second output electrode connected to said first impurity region;

a third output electrode connected to the second impurity region; and

wherein said first and second output electrodes are output electrodes of a first photodiode associated with said first PN junction,

said second and third output electrodes are output electrodes of a second photodiode associated with said second PN junction; and

an opaque film formed on the semiconductor device at a position where said first PN junction reaches the surface of said semiconductor substrate, said opaque film shielding said first PN junction from light impinging thereon.

4,318,116

Patent Not Issued For This Number

4,318,117

MOS INTEGRATED CIRCUIT

Yasoji Suzuki, Kawasaki; Minoru Takada, Omorinishi; Yasushi Satoh, and Hiroshi Osanai, both of Oita, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Nov. 13, 1979, Ser. No. 93,201

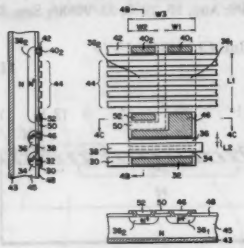
Claims priority, application Japan, Nov. 13, 1978, 53-139526

Int. Cl.³ H01L *27/04*

U.S. Cl. 357—42 **7 Claims**

1. A MOS integrated circuit including a substrate; a power supply conductor formed on said substrate; a first conductivity

type MOS transistor formed on said substrate spaced apart from said power supply conductor and comprising a first conductivity type drain, and a first conductivity type source; means for connecting said source to said power supply conductor comprising generally elongated first conductivity type and second conductivity type layers each having first and second ends, said second conductivity type layer having a resistivity



lower than that of said first conductivity type layer, means for coupling said first ends of both said layers to said power supply conductor and for coupling said second ends of both said layers to said source whereby said second conductivity layer is interconnected in parallel with said first conductivity type layer so that a turn-ON resistance between said drain and said source is lowered.

4,318,118

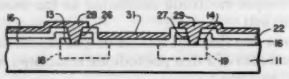
SEMICONDUCTOR STRUCTURE AND METHOD

John H. Hall, Saratoga, Calif., assignor to Micro Power Systems, Inc., Santa Clara, Calif.

Continuation of Ser. No. 945,512, Sep. 25, 1978, abandoned. This application Mar. 10, 1980, Ser. No. 128,860

Int. Cl.³ H01L *29/34*

U.S. Cl. 357—54 **2 Claims**



1. A semiconductor transistor structure comprising a body of semiconductor material containing impurities of one conductivity type having a surface, two spaced layers of low resistivity silicon oxide containing conductivity determining impurities of opposite conductivity type on said surface, two regions containing impurities of said opposite conductivity type inset into said body and extending to said surface and diffused inwardly from said silicon oxide layers, said two regions comprising source and drain regions of said transistor structure and said two spaced layers of low resistivity silicon oxide comprising low ohmic contacts to said source and drain regions, and an insulative layer covering said silicon oxide layers.

4,318,119

CONTINUOUS CARRIER WAVE GENERATING CIRCUIT

Kaichi Tatsuzawa, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 14, 1979, Ser. No. 102,974

Claims priority, application Japan, Dec. 19, 1978, 53-157130

Int. Cl.³ H04N *5/76, 9/44, 5/78*

U.S. Cl. 358—8 **9 Claims**

1. A continuous carrier wave generating circuit for a PAL color television system, comprising:

means for receiving a horizontal sync pulse included in a PAL color television signal reproduced from a record medium;

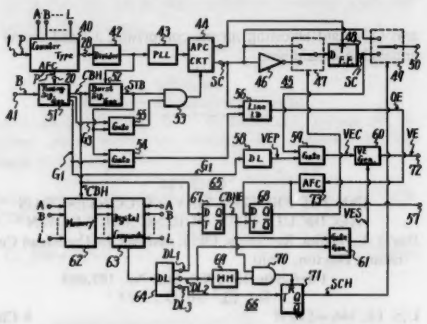
AFC circuit means for generating a periodic signal having a frequency which depends on said received horizontal sync pulse of the reproduced PAL color television signal;

means for receiving a burst signal also included in the PAL color television signal reproduced from the record medium;

APC circuit means supplied with said periodic signal from said AFC circuit means;

means supplied with said received first burst signal of the reproduced PAL color television signal and controlling said APC circuit means for causing the latter to produce a phase adjusted carrier wave in response to a phase of said received burst signal;

means responsive to the presence and absence of said received burst signal for determining when drop-outs occur in said reproduced PAL color television signal; and



phase converting means responsive to said means for determining when drop-outs occur for changing the phase of the carrier wave as phase adjusted by said APC circuit means from one to another of two phase conditions characteristic of successive lines in a PAL color television signal during drop-outs in the reproduced PAL color television signal.

4,318,120

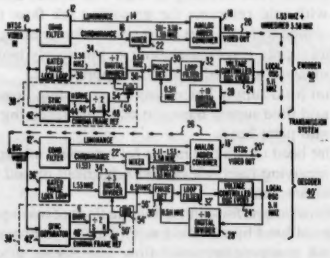
COLOR TV BURIED SUBCARRIER SYSTEM

Alfonse Acampora, Staten Island, N.Y., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 23, 1980, Ser. No. 171,381

Int. Cl.³ H04N *9/493*

U.S. Cl. 358—12 **11 Claims**



1. In a system including an encoder for translating a standard TV video signal to a buried subcarrier video signal, and a decoder for translating back to the standard video signal, the combination of

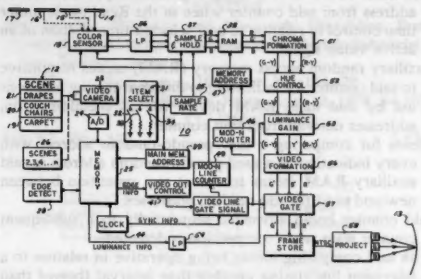
two similar local oscillators, one in the encoder and the other in the decoder, and

means to maintain the outputs of said two local oscillators at opposite phases differing by 180 degrees.

4,318,121
INTERIOR DECOR COMPOSITION AND DISPLAY SYSTEMS

Jason Taite, 4185 Alonzo Ave., Encino, Calif. 91316, and Leonard A. Ferrari, San Clemente, Calif., assignors to Jason Taite, Encino, Calif.

Filed May 6, 1980, Ser. No. 147,406
Int. Cl.³ H04N 9/535
U.S. Cl. 358—22 **22 Claims**



1. In a method of displaying an interior decor, the improvement comprising in combination the steps of:

providing a luminance image of said interior decor including said components;

providing different fabric samples for said components;

picking up the color of a first fabric sample;

picking up the color of a second fabric sample;

providing and displaying said image with the picked-up color of said first sample for one of said components and with the picked-up color of said second sample for another of said components;

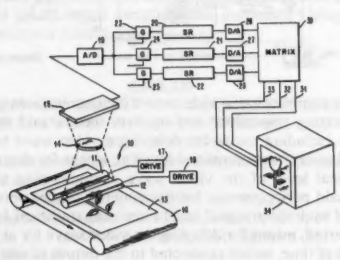
picking up the color of a third fabric sample; and

substituting in the display of said one component the picked-up color of said third sample for said picked-up color of the first sample.

4,318,122
ELECTRONIC COLOR SEPARATION

James M. White, Mint Hill, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 6, 1980, Ser. No. 194,208
Int. Cl.³ H04N 1/46, 3/15
U.S. Cl. 358—41 **8 Claims**



1. A color separation scanner comprising an optical system for focusing an image of a target region onto a photosensitive transducer for producing an electronic image of the light received thereby, wherein the improvement comprises:

a fluorescent lamp positioned to illuminate the target region, said lamp having first and second light output modes responding to first and second conditions of activation, said first light output mode providing light comprising principally a mixture of first and second colors and said second light output mode comprising principally light of said second color,

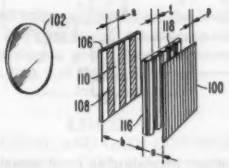
activation control means connected to said lamp for cyclically applying said first and second conditions of activation thereto, and

computational means responsive to the electronic images produced from light reflected from said target region during said first and second light output modes for producing first and second color-separated electronic images.

4,318,123
SOLID-STATE, COLOR-ENCODING TELEVISION CAMERA

Karl H. Knop, Zurich, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Jun. 5, 1980, Ser. No. 156,888
Int. Cl.³ H04N 9/07
U.S. Cl. 358—43 **8 Claims**



1. A solid-state, color-encoding television camera including:

a solid-state imager comprised of a periodic spatial pattern of discrete light-sensing cells;

an objective lens situated at a distance from said imager for imaging light of wavelength λ from a scene on said cells of said imager, said objective lens having an f-number F_o,

a periodic color-encoding filter having a given period s and a duty cycle δ which corresponds to a periodicity of said spatial pattern, said filter being situated between said objective lens and said imager at a distance (a+b) from said imager, and

a lenticular array comprising periodic lenslets having a period l in correspondence with the period s of said filter, said array being situated at a distance a from said imager and at a distance b from said filter and imaging said filter on said imager with a magnification m equal to b/a, said image of said periodic filter on said imager having a period p equal to s/m, with said period p being substantially equal to and substantially in alignment with a multiple of the spatial pattern period of discrete light-sensing cells,

wherein F_o, a, b and l have respective selected values such that substantially no moire pattern resolvable by an observer is present in said image, and

wherein said television camera has a given shape aperture, and wherein the selected value of F_o is equal to the quotient of the selected value of a divided by the product of the selected value of l and a selected positive number dependent on said given shape which results in said moire pattern in said image being a minimum.

4,318,124
AUTOMATIC REGISTRATION SYSTEM

Takashi Nakamura, and Yoshihiro Morioka, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

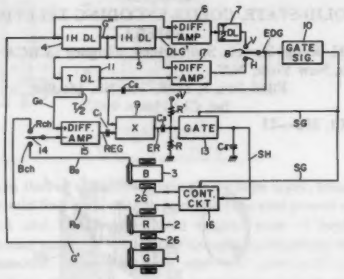
Filed Sep. 29, 1980, Ser. No. 191,683
Claims priority, application Japan, Sep. 29, 1979, 54-126154
Int. Cl.³ H04N 9/09
U.S. Cl. 358—51 **11 Claims**

1. Automatic registration apparatus for use in a plural-pick-up-device color television camera, for correcting misregistration of pictures picked up by at least a first and second pickup device from an object having at least one distinct edge, in

which said pickup devices scan in the vertical and in the horizontal directions and provide respective video output signals, comprising:

means for detecting the scanning of the edge of at least one said object and providing an edge signal in response to such detecting;

means for detecting the time difference between scanning of said at least one edge by said first pickup device and scanning thereof by said second pickup device, and providing a deflection signal representing such time difference;



multiplier means providing an error signal corresponding to the product of said edge signal and said deflection signal;

means for providing a misregistration signal, in response to said error signal, having a magnitude and a polarity respectively corresponding to the degree and direction of misregistration of the pictures of said first and second pickup devices; and

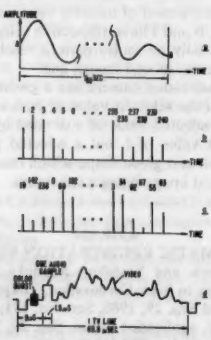
means for correcting misregistration of the picture of said second pickup device relative to the picture of said first pickup device, in response to said misregistration signal.

4,318,125

SOLID STATE DIGITAL AUDIO SCRAMBLER SYSTEM FOR TELETRANSMISSION OF AUDIO INTELLIGENCE THROUGH A TELEVISION SYSTEM

Harold B. Shutterly, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 25, 1979, Ser. No. 33,063
Int. Cl.³ H04N 7/16; H04K 7/04; H04N 7/04
U.S. Cl. 358—121 **4 Claims**



2. Apparatus for inserting scrambled audio samples in a television system on a line-per-line basis by insertion of at least one audio sample in a selected time portion of an active television line; comprising:

a main random-access-memory (RAM) device for storing audio samples in a sequence as received in the Write mode of said main RAM device, and for deriving scrambled audio samples to be inserted from said RAM device in the Read mode;

a pseudo-random generator for generating pseudo-random addresses;

a counter responsive to said pseudo-random generator for storing a generated pseudo-random address as an initial counter state;

said main RAM device using a generated pseudo-random address from said counter when in the Read mode under time control in relation to said selected time portion of an active video signal;

auxiliary random access memory (RAM) means responsive to said counter for indicating in different storing locations use by said main RAM device for all pseudo-random addresses derived from said counter;

means for comparing a new pseudo-random address with every indication of a used pseudo-random address in said auxiliary RAM means to detect any repetition between new and used pseudo-random addresses;

said counter being advanced sequentially to a subsequent counter state when a repetition is detected;

with said comparing means being operative in relation to a television line during another time interval thereof than said selected time portion for insertion;

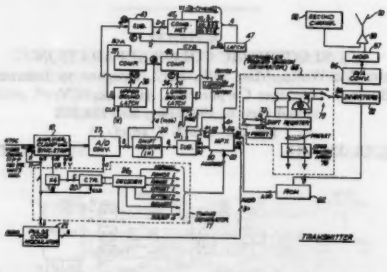
whereby every new pseudo-random address is checked for omission and repetition by said comparing means within a time interval representing the duration of a television line before being used by said main RAM device in the Read mode.

4,318,126

MULTIPLEXED VIDEO TRANSMISSION APPARATUS FOR SATELLITE COMMUNICATIONS

Marvin L. Sassler, 56 Palmer Dr., Wayne, N.J. 07470

Filed Apr. 2, 1980, Ser. No. 136,547
Int. Cl.³ H04N 7/04
U.S. Cl. 358—141 **18 Claims**



1. In combination in video wave communications apparatus, cooperating transmitter and receiver means; said transmitter means including means for delaying a video wave being processed over a predetermined interval; means for determining a statistical level of the video wave characterizing said wave over said period, means for determining the maximum variation of said video signal level from said statistical level over said period, means for delaying the video wave for at least said period of time, means connected to the output of said delaying means for subtracting from said output video wave said statistical level determined by said statistical level determining means for creating a variation content signal, variable amplification means comprising a first read only memory connected to said subtracting means for amplifying said variation content signal by a scale factor dependent upon the output of said maximum variation determining means, and means for transmitting said statistical level, said scale factor and said amplified variation content signal; said receiver means comprising means for receiving said transmitted statistical level, scale factor and ampli-

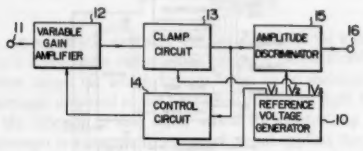
fied variation content signal, variable reducing means comprising a second read only memory for selectively reducing said variation content signal dependent upon said received scale factor, means for combining said reduced variation signal and said received statistical level to thereby reconstitute the video wave.

4,318,127

MULTIPLEXED TELEVISION SIGNAL PROCESSING SYSTEM

Shin Fukuda, Hirakata, and Masayoshi Hirashima, Ibaraki, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Aug. 1, 1980, Ser. No. 174,620
Claims priority, application Japan, Aug. 13, 1979, 54-103023
Int. Cl.³ H04N *7/00*
U.S. Cl. 358—147 **5 Claims**



1. A multiplexed television signal processing system comprising:

a receiving circuit for receiving a binary signal transmitted in superposition on a television signal;

a reference voltage generating circuit for generating a first reference voltage, a second reference voltage higher than said first reference voltage and a third reference voltage lower than said first reference voltage by a difference between said first reference voltage and said second reference voltage;

a variable gain amplifier circuit adapted to receive said television signal having the binary signal superimposed thereon;

a clamp circuit for clamping and holding a lower (or upper) level of a pilot signal in said binary signal to said third (or second) reference voltage during a period around the pilot signal period;

a control circuit for detecting the upper (or lower) level of said pilot signal during the period around the pilot signal period, comparing the detected level with said second (or third) reference voltage and controlling the gain of said variable gain amplifier such that said detected level becomes equal to said second (or third) reference voltage; and

an amplitude discrimination circuit for amplitude-discriminating said binary signal using said first reference voltage as a discrimination reference.

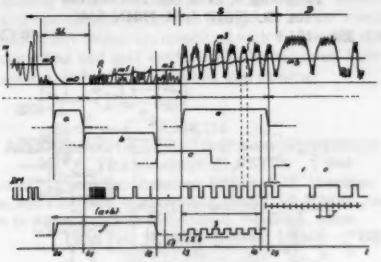
4,318,128

PROCESS AND DEVICE FOR RETRIEVING DIGITAL DATA IN THE PRESENCE OF NOISE AND DISTORTIONS

Maurice Sauvanet, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jul. 15, 1980, Ser. No. 169,213
Claims priority, application France, Jul. 17, 1979, 79 18468
Int. Cl.³ H04N *5/44*; H04L *7/10*; H03K *5/153*
U.S. Cl. 358—147 **15 Claims**

1. A process for establishing the average value of a voltage during the presence of a burst signal formed by a succession of alternating 1s and 0s, so that, after chopping to a level corresponding to said average value, successive 1 and 0 are of the same width, the average value being taken substantially between the beginning and the end of the burst, and this average value being stored at the end of the burst then brought to a reference value before the appearance of the following burst, comprising bringing the value considered to an initial level lower than or substantially equal to half the smallest foreseeable burst amplitude before the appearance of the burst then increasing this level in accordance with the signal received, in a time interval preceding the earliest probable time of appearance of the burst, so as to fix a threshold voltage greater than



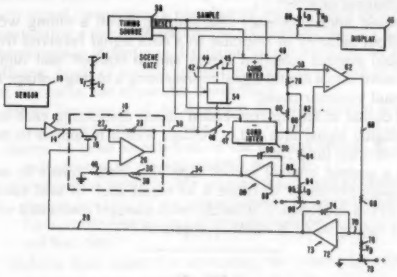
the initial level and taking into account the level of the noise and disturbances, and establishing the average value from said threshold value during a given duration, counted from the appearance of the first 1 of the burst.

4,318,129

AUTOMATIC LEVEL AND GAIN CONTROL SYSTEM

Robert Zwirn, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Jun. 30, 1980, Ser. No. 164,728
Int. Cl.³ H04N *5/52*
U.S. Cl. 358—174 **7 Claims**



1. A level and gain control system responsive to a video signal received from a scene for controlling the level and dynamic range of said video signal comprising:

a control circuit responsive to said video signal for controlling the level and gain of said video signal,

positive and negative conditional integrators, coupled in parallel to said control circuit, for respectively detecting the positive and negative conditionally integrated peaks of said video signal as a function of the peak voltages of said video signal,

first integrator means coupled to said positive and negative conditional integrators for establishing the median level of the output signals therefrom, said first integrator means being coupled to said control circuit for controlling the level of said video signal,

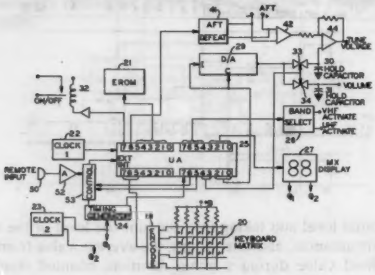
second integrator means coupled to said positive and negative conditional integrators for integrating the difference of the output signals from said first and second integrator means and coupled to said control circuit for controlling the dynamic range of said video signal, and

output means coupled to said control circuit for receiving the video signal having a controlled level and dynamic range.

4,318,130
MICROPROCESSOR CONTROL SYSTEM FOR TELEVISION RECEIVERS

Daniel A. Heuer, Fort Wayne, Ind., assignor to The Magnavox Company, New York, N.Y.

Filed Aug. 9, 1978, Ser. No. 932,141
Int. Cl.³ H04B 1/16; H04N 5/44
U.S. Cl. 358—191.1 **10 Claims**



1. A system for controlling a television receiver having a varactor tuner comprising:

(a) a microprocessor;

(b) control selection means for supplying data signals to said microprocessor indicating specific channels to be tuned on said television receiver;

(c) a memory containing a plurality of tuning words specifying the tuning voltages for said varactor tuner, each of said tuning words having an address associated with a channel number;

(d) said microprocessor operating to recall a tuning word from memory in response to a data signal received from said control selection means and to convert said tuning word into a digital signal representing a tuning voltage for said varactor tuner;

(e) digital to analog conversion means converting each said digital signal into a d.c. voltage which it applies to said varactor tuner; and

(f) a second control means supplying data signals to said microprocessor to cause it to recall each of said tuning words in sequence, whereby each channel associated with a tuning word is tuned in sequence.

4,318,131
TV CAMERA SYSTEM HAVING SYNCHRONIZED OSCILLATORS IN CAMERA HEAD AND CCU

Mitsuhiko Okuhara, Yokohama; Taizou Nishino, Tokyo; Kazuo Kawamura, Yokohama, and Toshiaki Aoki, Kawasaki, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Mar. 28, 1980, Ser. No. 135,129
Claims priority, application Japan, Mar. 30, 1979, 54-36959
Int. Cl.³ H04N 5/30
U.S. Cl. 358—210 **9 Claims**

7. In a television camera apparatus including a camera control unit for generating first information signals, a camera head for generating second information signals, and a camera cable for transmitting the first and second information signals between the camera control unit and the camera head, a system for controlling the transmission of the first and second information signals over the cable, the system comprising:

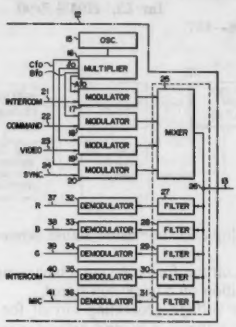
first means associated with said camera control unit for generating a first reference frequency signal;

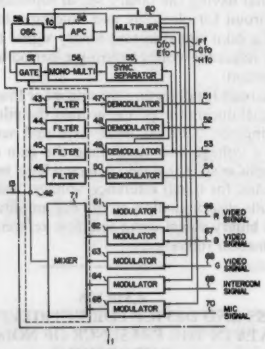
second means associated with said camera head for generating a second reference frequency signal;

third means associated with said camera control unit for (1) generating first carrier signals having frequencies that are multiples of said first reference frequency signal, (2) modulating said first carrier signals with said first information signals, and (3) transmitting said modulated first carrier signals in a multiplexed manner to said camera head over said cable;

first demodulating means associated with said camera head for receiving and for demodulating said multiplexed modulated first carrier signals and for separating said first information signals from said received and demodulated first carrier signals;

fourth means associated with said camera head for (1) generating second carrier signals having frequencies that are multiples of said second reference frequency signal, (2) modulating said second carrier signals with said second information signals, and (3) transmitting said modulated





second carrier signals in a multiplexed manner to said camera control unit over said cable;

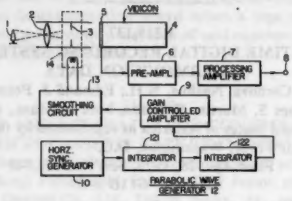
second demodulating means associated with said camera control unit for receiving and for demodulating said multiplexed modulated second carrier signals and for separating said second information signals from said received and demodulated second carrier signals; and

fifth means in one of said camera control unit and said camera head for detecting a difference between the frequency of said first reference frequency signal and the frequency of said second reference frequency signal and for controlling said generating means of said one of said camera control unit and said camera head to adjust the frequency of said reference signal generated thereby to eliminate said detected frequency difference.

4,318,132
AUTOMATIC EXPOSURE CONTROL APPARATUS FOR TELEVISION CAMERAS

Toyotaka Machida, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Filed Mar. 10, 1980, Ser. No. 128,876
Claims priority, application Japan, Mar. 13, 1979, 54-28977
Int. Cl.³ H04N 5/26
U.S. Cl. 358—228 **8 Claims**



1. An automatic exposure control apparatus for a television camera including a camera tube having a photoelectrical conversion target on which light is made to be incident, an iris diaphragm disposed in the path of said incident light for varying the amount of said light, means for controlling said iris diaphragm in response to a control signal applied thereto, and means for generating a video signal from said conversion target in response to horizontal and vertical synchronization pulses, comprising:

first means for generating a modulating signal having a magnitude that decreases gradually over a portion of the period between successive pulses of one of said horizontal and vertical synchronizations, said portion corresponding to a peripheral area of said conversion target;

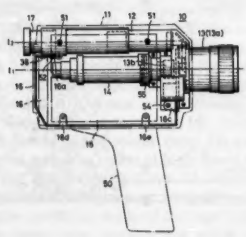
second means having a variable degree of amplification for modulating the amplitude of said video signal in accordance with said modulating signal so that the video signal is amplified at an amplification factor which gradually decreases as a function of distance from the center of said target; and

third means responsive to the modulated video signal for generating a d.c. signal which is an average value of said modulated video signal and applying said d.c. signal to said diaphragm control means as said control signal.

4,318,133
SIMPLIFIED TYPE TELEVISION CAMERA

Yoshichi Ohtake, Kamakura, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Apr. 30, 1980, Ser. No. 145,227
Claims priority, application Japan, May 1, 1979, 54-53646; May 1, 1979, 54-53647; May 1, 1979, 54-58476[U]; Jul. 13, 1979, 54-96578[U]
Int. Cl.³ H04N 5/30
U.S. Cl. 358—229 **9 Claims**



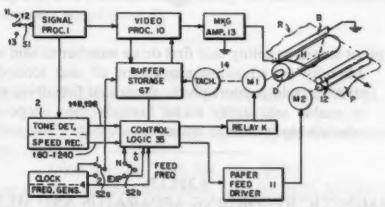
1. A simplified type television camera including a flanged modular optical system comprising a main lens system, a camera (pickup) tube, and an optical viewfinder,

said television camera comprising a single frame consisting of a pair of half frames respectively having opposing contact surfaces contacting with each other along a surface including an optical axis of the optical system and holding parts for independently holding the modules of said optical system by their flanges in a state where the pair of half frames are combined with the contact surfaces contacted and said modules can be removed from said camera without disassembling said camera.

4,318,134
RECORDING GRAPHIC DATA OF DIFFERENT TRANSMISSION RATES

Malcolm F. Partridge, Braintree; Frederick W. Simpkins, Hudson, and Lawrence A. Farrington, Natick, all of Mass., assignors to Alden Research Foundation, Westboro, Mass.

Filed Feb. 12, 1979, Ser. No. 11,146
Int. Cl.³ H04N 1/04
U.S. Cl. 358—287 **16 Claims**



1. Apparatus for recording different kinds of transmitted electrical signals on a moving web of predetermined width, each signal comprising a plurality of lines of information and constituting a frame of graphic information including a distinct characteristic identifying a suitable aspect ratio of the frame, different kinds of signals comprising lines occurring at different line rates, the apparatus comprising:

means for receipt of the signals at their transmitted line rate and storage of the signals;

means to read signals out of the storage means at a rate independent of the transmitted line rate;

scan means coupled to the storage means and responsive to signals read out of the storage means to record successive lines on the web at a scan rate independent of the transmitted line rate;

variable feed means for advancing the recording web relative to the scan means at one of a plurality of substantially different speeds; and

means responsive to the transmitted signal for selecting the web feed speed dependent on the distinctive characteristic of the transmitted signal whereby signal groups of different line rates are recorded each in a suitable aspect ratio.

4,318,135
ALIGNMENT SYSTEM FOR SCANNING ARRAYS

Robert F. Allis, both of Rochester, N.Y.; William Kingsley, and Robert F. Allis, both of Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 12, 1979, Ser. No. 84,222
Int. Cl.³ H04N 1/024
U.S. Cl. 358—294 **5 Claims**

1. In a raster input scanner, the combination of:

(a) a frame;

(b) at least one array of image viewing elements;

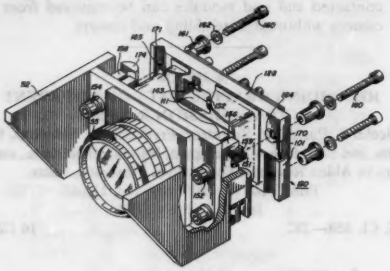
(c) optical means forming a path for image rays to said array image viewing elements;

(d) a support for said array, said support being mounted on said frame for movement relative thereto; and

(e) at least one focus adjusting member on said frame and

drivingly coupled to said support for moving said support together with said array in a direction paralleling the optical axis of said optical means,

said focus adjusting member comprising first and second drive members threadedly engaged with said frame and drivingly coupled to said support adjacent opposite ends thereof, and



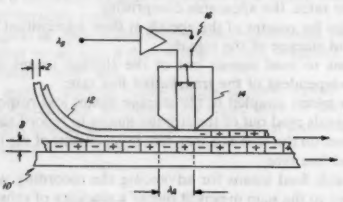
pivot means coupling said first drive member to said support whereby on adjusting movement of said second drive member, said support pivots about said first drive member to enable said array to be brought into perpendicular relationship with said optical axis.

4,318,136

MAGNETIC RECORDING APPARATUS AND METHOD

Frederick J. Jeffers, Escondido, Calif., assignor to Spin Physics, Inc., San Diego, Calif.

Filed Feb. 13, 1980, Ser. No. 121,197
Int. Cl.³ G11B *5/86, 5/47*
U.S. Cl. 360—17 **7 Claims**



1. Apparatus for recording information signals in a primary magnetic recording medium having a given coercivity, said apparatus comprising:

(a) a gapped magnetic head adapted to record said information signals in said primary magnetic recording medium;

(b) means for providing relative motion between said primary magnetic recording medium and said head, whereby flux fringing the gap of said head coacts with said primary magnetic recording medium at different points thereof; and

(c) an ancillary magnetic recording medium having prerecorded therein an alternating signal, said ancillary recording medium having a greater coercivity than said given coercivity and being so disposed with respect to the primary medium that flux from the ancillary medium applies a magnetic field to said primary medium in proximation to the gap of said gapped magnetic head, whereby the information signal flux and the flux from the ancillary medium algebraically add to effect recording of said information signals in said primary recording medium,

said apparatus being adapted for recording information signals of a predetermined wavelength in said primary medium,

(a) said pre-recorded signal of said ancillary medium having the same predetermined wavelength as the information signals; and

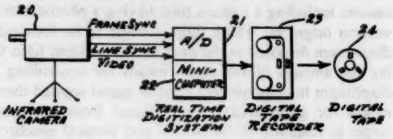
(b) said apparatus including means for so providing relative motion between said ancillary medium and said magnetic head that signal flux from said ancillary medium is in sync with the information signal flux at the gap of said head.

4,318,137

REAL TIME DIGITAL RECORDING SYSTEM FOR THERMOVISION DATA

Ronald J. Cordova, Nashua, N.H.; Edmund J. Peters, Bedford, and James S. Martin, Brighton, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 28, 1978, Ser. No. 900,948
Int. Cl.³ G11B *5/00*
U.S. Cl. 360—32 **4 Claims**



1. A direct video to digital data recording system comprising infrared camera means having a given frame rate and generating analog output signals during active scan periods,

analog/digital converter means for digitizing the analog output signals at a high data rate,

digital data recording means, and

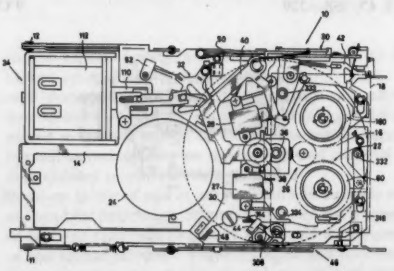
computer means, said computer means being adapted to receive and store digitized data from said analog/digital converter means at said high data rate during camera active scan periods while simultaneously transferring a continuous uniform flow of said digital data previously and currently received in sequence of arrival to said digital data recording means at a lower data rate.

4,318,138

AUTOMATIC REVERSE CASSETTE TAPE RECORDER WITH A ROTATABLE HEAD-SUPPORTING BOARD

Akira Osanai, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 16, 1979, Ser. No. 94,930
Claims priority, application Japan, Nov. 16, 1978, 53-141617; Nov. 16, 1979, 53-157808[U]
Int. Cl.³ G11B *15/18, 19/02*
U.S. Cl. 360—69 **13 Claims**



1. An automatic reverse cassette tape recorder comprising a pair of reel shafts for a supply reel and a takeup reel, a capstan

shaft and a rotatable magnetic head-supporting board having a forward magnetic head and a reverse magnetic head mounted thereon, both heads being of the 4-track, 2-channel type, means for pivoting the board about a pivot point, said pivot point and said capstan shaft being located on a straight line perpendicular to and bisecting a straight line joining said reel shafts and being located on opposite sides respectively of said straight line joining said reel shafts, said magnetic heads being located at substantially equal distance from said pivot point, means for detecting the end of a tape, and means responsive thereto for rotating said head-supporting board when a tape end is detected, whereby the supply reel side of said capstan is brought into contact with a tape face.

4,318,139

METHOD AND APPARATUS FOR CONTROLLING A MICROCASSETTE TAPE TRANSPORT

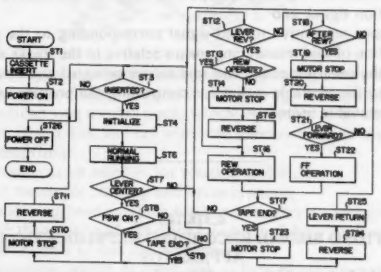
Tutomu Shibata; Akira Osanai; Hideo Tomabechi, all of Hachioji, and Kenji Fujibayashi, Tokyo, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 26, 1980, Ser. No. 134,064

Claims priority, application Japan, Apr. 6, 1979, 54-41601

Int. Cl.[3] G11B *15/48*

U.S. Cl. 360—71 **12 Claims**



1. A method for controlling a single-motor type microcassette tape transport which transports tape in a microcassette at a constant speed, comprising:

terminating the control of a microcassette tape transport when no microcassette tape is loaded into a transport (step **3** "NO");

judging, when a microcassette tape is loaded thereinto (step **3** "YES"), whether or not it is immediately after the loading of the microcassette tape into the tape transport (step **4**) and, when it is immediately after the loading, rotating said motor at a constant speed (step **6**), and, when it is not immediately after the loading, continuing a constant speed rotation of the motor (step **6**);

reversing the direction of the constant speed transport of the tape of a microcassette caused by the constant speed rotation of the motor (step **8** "YES") by stopping the motor (step **10**), reversing the direction of rotation of the motor (step **11**), and then causing the motor to rotate at a constant speed in said reverse direction (step **6**);

changing the operation mode of the tape transport from a constant speed tape transporting mode to a rewind mode (step **12** "YES") responsive to a command, by judging whether or not the tape transport in the rewind mode (step **13**) and, if it is not in the rewind mode (step **13** "NO"), stopping the motor (step **14**), reversing the direction of rotation of the motor (step **15**) and subsequently causing the motor to rotate at high speed (step **16**), and, if it is in the rewind mode (step **13** "YES"), causing the motor to rotate at high speed (step **16**);

changing the operation mode of the tape transport from the constant speed tape transporting mode to fast forward mode (step **12** "NO") responsive to a command by judging whether or not it is after the rewind mode (step **18**), and, if it is after the rewind mode (step **18** "YES"), stopping the motor (step **19**), reversing the direction of rotation of the motor (step **20**) and subsequently causing the motor to rotate at high speed (step **22**), and if it is not after the rewind mode (step **18** "NO"), causing the motor to rotate at high speed (step **2**);

returning the operation mode from the rewind mode to the constant speed transport mode (step **12** "NO"; step **18** "YES"; step **21** "NO"), by stopping the motor (step **19**), reversing the direction of rotation of the motor (step **20**) and subsequently causing the motor to rotate at a constant speed (step **6**);

returning the operation mode from the fast forward mode to the constant speed tape transporting mode (step **12** "NO"; step **18** "NO"; step **21** "NO"), by causing the motor to rotate at a constant speed (step **6**); and

changing the operation mode from the rewind mode to the constant speed tape transporting mode to transport the microcassette tape in an opposite direction to that in the rewind mode (step **17** "YES"), by stopping the motor (step **23**), reversing the direction of rotation of the motor (step **24**), and subsequently causing the motor to rotate at a constant speed (step **6**).

4,318,140

VIDEO TAPE REPRODUCING APPARATUS WITH VARIOUS TAPE SPEEDS

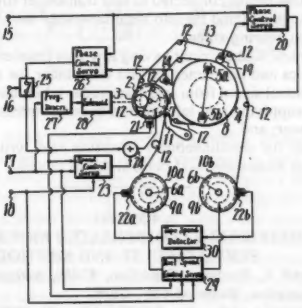
Yasuo Shigeta, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 25, 1979, Ser. No. 78,762

Claims priority, application Japan, Sep. 26, 1978, 53-118249

Int. Cl.[3] G11B *15/54, 15/18, 19/28*

U.S. Cl. 360—73 **12 Claims**



1. Video tape reproducing apparatus with various tape speeds such as slow, fast, reverse slow and reverse fast modes, comprising:

(a) helical scan rotary magnetic heads for scanning oblique video tracks on a video tape;

(b) a capstan and pinch roller assembly for advancing said video tape at various tape speeds in both forward and reverse directions;

(c) a rotation pulse generator for generating rotation pulses indicative of the rotational speed of said capstan;

(d) means for applying a variable frequency command signal which has a frequency indicative of the command speed which can be other than normal speed control commands;

(e) a frequency comparator for detecting the frequency difference between said rotation pulses and said command signal; and

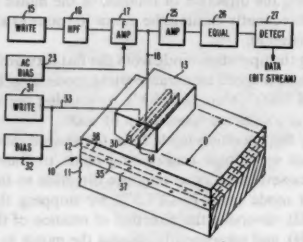
(f) a capstan drive circuit including means for controlling the rotational speed of said capstan in response to the detected output of said frequency comparator.

4,318,141

BURIED SERVO RECORDING SYSTEMS AND METHODS

Munro K. Haynes, Tucson, Ariz., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Dec. 7, 1979, Ser. No. 101,380
Int. Cl.³ G11B 21/10
U.S. Cl. 360—77 26 Claims



1. A magnetic recorder having a single gap magnetic transducer adapted to exchange signals with an adjacent magnetic record medium along a record track being scanned by the transducer, said record medium having a hard recorded control signal, said control signal being a narrow-band low-frequency signal,

the improvement including in combination:

information-bearing signal write means connected to said transducer and including high pass frequency characteristics for supplying information bearing signals to said transducer for recording same on the adjacent magnetic medium;

AC bias means connected to said transducer for supplying an AC bias signal thereto simultaneously with said information bearing signal;

a control signal circuit having low pass frequency characteristics and connected to said transducer for receiving said control signal from said transducer while said write means is supplying said information bearing signals to said transducer; and

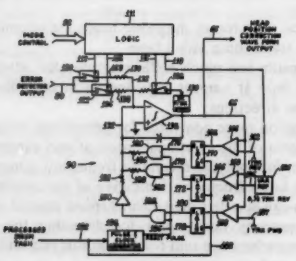
means for simultaneously actuating said write means, AC bias means and said control signal circuit.

4,318,142

AUTOMATICALLY COMPENSATED MOVABLE HEAD SERVO CIRCUIT AND METHOD

Raymond F. Ravizza, Cupertino, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Continuation of Ser. No. 889,994, Mar. 23, 1978, abandoned.
This application Dec. 31, 1979, Ser. No. 109,013
Int. Cl.³ G11B 5/52, 21/10
U.S. Cl. 360—77 4 Claims



1. In a recording and/or reproducing apparatus having transducing means operatively supported for transferring information with respect to tracks along a record medium, the transducing means mounted on movable means for displacing the transducing means in opposite directions in response to a signal being applied thereto, the combination comprising:

means for generating an oscillatory signal coupled to effect oscillatory motion of said movable means;

signal generating means responsive to the oscillatory motion of said movable means for generating an oscillatory motion signal having a selected frequency component corresponding to the oscillatory motion of said movable means;

means responsive to the oscillatory motion of said movable means for generating a signal corresponding to the position of said transducing means relative to the tracks along the record medium;

means responsive to said signal representative of the motion of said movable means for producing a reference signal that is in correspondence with said motion, said means for producing the reference signal including means for filtering said selected frequency component from said oscillatory motion signal for generation of said reference signal, said means for filtering comprising a commutating capacitor filter operative in response to the oscillatory signal and higher frequency reference timing signal for filtering the selected frequency component from the oscillatory motion signal; and

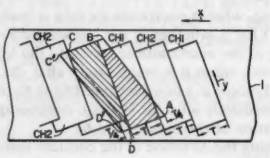
means responsive to said signal corresponding to the position of said transducing means relative to the tracks along the record medium and said reference signal and coupled to the movable means for controlling the position of the movable means.

4,318,143

VIDEO SIGNAL RECORDING-REPRODUCTION APPARATUS

Takashi Kubota, Mito, and Shinya Ichimura, Katsuta, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 21, 1979, Ser. No. 77,837
Claims priority, application Japan, Sep. 22, 1978, 53-115788
Int. Cl.³ G11B 21/00
U.S. Cl. 360—84 2 Claims



1. For use in a video tape recorder having a rotary head assembly of the helical scan type including two rotary magnetic heads and means for moving a magnetic tape past said heads, a rotary head assembly comprising:

a first magnetic head having a gap width which is larger than the predetermined pitch of the tracks formed obliquely by helical scanning on the magnetic tape, a second magnetic head having a different gap width from the gap width of said first magnetic head, said gap width of said second magnetic head which is also larger than said track pitch, a corresponding end of the gap of said first and second magnetic heads being positioned in a manner to coincide with a common reference level; and

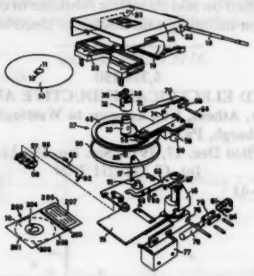
means for rotating said first and second magnetic heads at a speed to helically scan the magnetic tape along tracks having said predetermined pitch.

4,318,144

FLEXIBLE MAGNETIC DISK RECORDING APPARATUS

Alighiero Galvagni, Ivrea, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Continuation of Ser. No. 881,656, Feb. 27, 1978, abandoned. This application Apr. 29, 1980, Ser. No. 144,867
Claims priority, application Italy, Mar. 4, 1977, 67478 A/77
The portion of the term of this patent subsequent to Sep. 23, 1997, has been disclaimed.
Int. Cl.[3] G11B *17/00, 19/28, 15/46, 5/82*
U.S. Cl. 360—99 7 Claims



1. An apparatus for recording and/or reading binary information on a flexible magnetic disk having a magnetizable surface carrying a spiral track, which tracks lies on an annular region of said disk, and can store said information, said apparatus comprising:

a rotatable drive member for rotating said disk;

motor means for rotating said drive member;

a transducing head movable across said region in synchronism with the rotation of said drive member to follow a spiral path with respect to said drive member;

a supporting holder for said disk, which holder is movable from an insertion position wherein said disk is insertable in said apparatus, to a working position wherein said disk is engageable by said drive member;

start means operative when said holder is in said working position for starting the rotation of said motor; and

means for angularly positioning said disk with respect to said drive member to position said transducing head to cause said spiral track to coincide with said spiral path for recording and/or reading said binary information.

4,318,145

MULTIPLE-TRANSDUCER/ACTUATOR ARRAY

Jorgen Frandsen, Manitoba, Canada, assignor to Burroughs Corporation, Detroit, Mich.

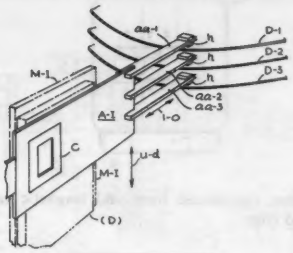
Division of Ser. No. 85,945, Oct. 18, 1979, abandoned. This application Dec. 26, 1979, Ser. No. 107,455
Int. Cl.[3] G11B *5/55, 21/08;* H02K *41/00*
U.S. Cl. 360—106 10 Claims

1. In an improved disk file including a stack of digital recording disks characterized by an array of inter-disk gaps disposed at respective sites separated by a common gap-distance along a prescribed stacking direction, the combination therewith of improved multi-transducer translation means comprising:

flat-coil linear actuator means including coil means and an array of any number, N, like transducer arm means mounted projectingly from said actuator means to be separated from one another by said gap-distance;

vertical magnetic drive means adapted to drive said actuator means positioningly along a prescribed vertical path in said stacking direction; and lateral drive means adapted to selectively translate said actuator means into, and out of, said stack whereby to insert and position the transducer means carried thereby in selected gap site;

said vertical drive means comprising at least one opposing pair of magnet pole pieces disposed opposingly along said path



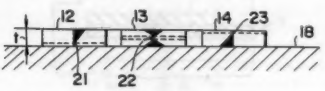
and arranged to drivingly, inductively interact with the coil means of said actuator means.

4,318,146

ROTARY HEAD ASSEMBLY

Kazuo Ike, Kamakura; Katsuichi Tachi, Kawasaki, and Tetsuro Kato, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 28, 1979, Ser. No. 107,837
Claims priority, application Japan, Dec. 29, 1978, 53-162266
Int. Cl.[3] G11B *21/18, 5/52, 5/027, 5/25*
U.S. Cl. 360—107 4 Claims



1. A rotary head assembly having a plurality of magnetic heads for scanning magnetic tape comprising; a tape guide member for guiding a magnetic tape on the periphery thereof, a rotary member for carrying said plurality of magnetic heads and carrying a planar head base plate with a flat supporting surface, said plurality of magnetic heads mounted side by side on said supporting surface of said head base for scanning said tape, all of said plurality of heads having the same thickness, portions of the transducing gap of each of said plurality of heads removed to form effective magnetic gaps spaced different distances from said supporting surface so that each of said magnetic heads scan a different portion of said tape.

4,318,147

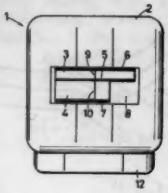
MAGNETIC CARD RECORDING AND/OR REPRODUCING APPARATUS

Shigenori Nomura, Mitaka, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jul. 16, 1979, Ser. No. 58,103
Claims priority, application Japan, Jul. 20, 1978, 53/99953[U]
Int. Cl.[3] G11B *5/27, 25/04*
U.S. Cl. 360—119 9 Claims

1. A magnetic card recording and/or reproducing apparatus having means for receiving one edge of a magnetic card and horizontally advancing the same, said magnetic card having a magnetic track parallel to said one edge thereof, drive means for advancing said magnetic card, a magnetic head having aligned upper and lower cores whose gaps are so arranged as

to be aligned one above the other, the same signals being recorded on said card by said upper and lower head cores, and



signals being reproduced from said magnetic card by said upper head core.

4,318,148

THIN-FILM MAGNETIC HEAD

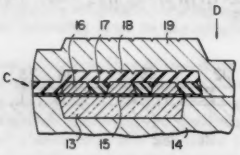
Nobuyuki Kaminaka, Moriguchi; Kenji Kanai, Neyagawa; Norimoto Nouchi, Katano, and Noboru Nomura, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 1, 1980, Ser. No. 165,104

Claims priority, application Japan, Jul. 4, 1979, 54-85200

Int. Cl.³ G11B *5/14, 5/20*

U.S. Cl. 360—127 **2 Claims**



1. A thin-film magnetic head comprising:

a magnetic substrate;

a layer deposited on said magnetic substrate and including a spiral pattern conductor layer in the form of a coil of two or more turns, a first non-magnetic insulating layer filling gaps between segments of said spiral pattern conductor layer and being substantially flush with said conductor layer, and a second non-magnetic insulating layer deposited on said conductor and first insulating layer; and

a magnetic layer deposited on said second non-magnetic layer and forming a gap portion together with said magnetic substrate on one side of the lamination thus formed, said one side being in contact with or in the vicinity of a magnetic recording medium.

4,318,149

RC COMPOSITE COMPONENT WITH SPARK GAP

Tetsuya Murakawa, Fukui, and Toshimi Kaneko, Sabae, both of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Jul. 3, 1980, Ser. No. 165,634

Claims priority, application Japan, Jul. 13, 1979, 54-97375[U]

Int. Cl.³ H02H *9/06*

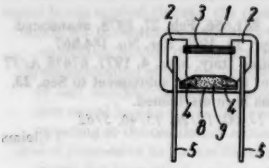
U.S. Cl. 361—15 **25 Claims**

1. An RC composite component with a spark gap having a capacitor and a resistor, comprising:

a dielectric substrate,

a pair of discharge electrodes formed on said dielectric substrate to define said spark gap therebetween, which has a predetermined spacing, and

film forming means including a varnish for adjusting the flashover voltage to a predetermined range, said means



being formed on said dielectric substrate to cover a particular region including said discharge electrodes.

4,318,150

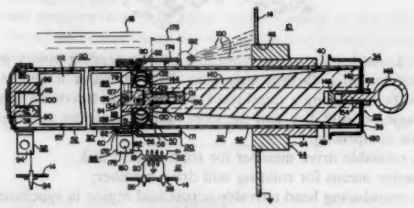
PROTECTED ELECTRICAL INDUCTIVE APPARATUS

Edgar R. Eley, Athens, Ga., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 17, 1979, Ser. No. 104,222

Int. Cl.³ H02H *7/04*

U.S. Cl. 361—41 **5 Claims**



1. Protected electric inductive apparatus, comprising:

a metallic casing having primary and secondary electrical bushings and an opening,

liquid dielectric means disposed in said casing,

electrical winding means disposed in said casing and immersed in said liquid dielectric means,

protective fuse apparatus including a tubular receptacle and a removable fuse portion,

said receptacle having first and second ends, a wall portion having an inner surface which defines an air space which extends between its ends, means sealing the opening at its second end, said first and second spaced electrical terminals each having portions which are respectively accessible from the inside and outside of said tubular receptacle,

means sealingly mounting said receptacle through the opening in said casing to prevent the liquid dielectric means from entering the air space, with the first end of the receptacle being accessible outside the casing, and the second end extending into said casing such that at least the first and second spaced electrical terminals are immersed in said liquid dielectric means,

means electrically connecting the outer portions of said first and second spaced electrical terminals to a primary bushing and said electrical winding means, respectively,

said removable fuse portion having first and second ends, including handle means at the first end and fuse means adjacent to the second end, said removable fuse portion including first and second electrical contact means which engage the inner portions of said first and said electrical terminals, respectively, when the removable fuse portion is in assembled relation with said receptacle,

said first electrical terminal including a first tubular member having first and second axially spaced ends, with the first end being part of the inner portion of the first electrical terminal, said first end being the closest live element within the air space of said receptacle to said metallic casing when the primary bushing is connected to a source

of electrical potential, providing an electric field between said first end and said casing,

and means electrically connected to said first electrical terminal for reshaping said electric field to transfer the high potential gradient which would normally exist adjacent to the first end of the first electrical terminal, outwardly away from the air space and into the liquid dielectric.

4,318,151

EARTH LEAKAGE PROTECTION DEVICES

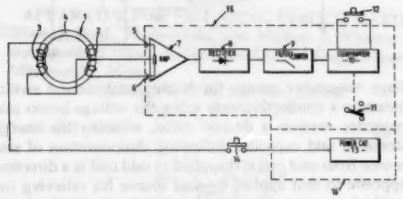
David J. Balchin, Kenton, England, assignor to Trident Equipment Limited, Ware, England

Filed May 29, 1980, Ser. No. 154,258

Claims priority, application United Kingdom, May 29, 1979, 18540/79

Int. Cl.³ H02H *3/16*

U.S. Cl. 361—45 **10 Claims**



1. An earth leakage protection device for use with the AC supply lines of an AC system, said device comprising a core balance current sensing transformer having a core and a secondary winding thereon through which a fault signal current is caused to flow in response to imbalance between the currents flowing through said AC supply lines which, in use, pass through said core of said transformer to constitute primary windings thereof, amplifier circuit means coupled to said secondary winding for amplifying said fault signal, precision rectifier circuit means coupled to said amplifier means for performing full wave rectification of said amplified signal, delay circuit means coupled to said rectifier circuit for delaying said signal in accordance with an inverse definite minimum time characteristic whereby said signal is reproduced in a minimum time or in a time which is inversely related to the strength of said signal, and trigger circuit means responsive to a signal of a predetermined magnitude from said delay circuit means to actuate a safety device in said AC supply lines, said precision rectifier circuit means comprising a pair of operational .amplifiers of the differential input and single ended output type, said operational amplifiers having their non-phase inverting inputs connected in common, and the output of one of said operational amplifiers being coupled through a diode to the non-phase inverting input of said other operational amplifier.

4,318,152

DIGITAL HIGH VOLTAGE MONITOR AND DISPLAY FOR ELECTROSTATIC PRECIPITATORS

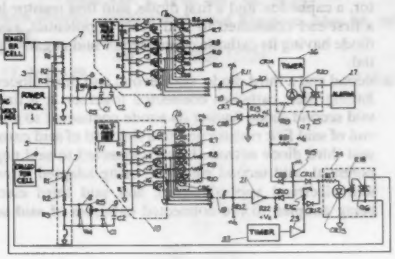
William G. Weber, West Chester, Ohio, assignor to United Air Specialists, Inc., Cincinnati, Ohio

Filed Oct. 5, 1979, Ser. No. 82,124

Int. Cl.³ B03C *3/68*; H02H *3/24*

U.S. Cl. 361—92 **19 Claims**

1. In an electrostatic precipitator of the type having an ionizer cell including a plurality of ionizer electrodes for charging airborne particles, a collector cell positioned downstream from said ionizer cell including a plurality of collector electrodes for collecting said charged particles, and power pack means producing a relatively high voltage output for charging said ionizer and collector electrodes, the improvement in combination therewith comprising means for monitoring the magnitude of said high voltage including means for converting the magnitude of said high voltage to a digitial output code representing said magnitude value, comparison means responsive to said digital output for providing an output signal when said high voltage magnitude is less than a predeter-



mined value, and means responsive to said comparison means output for inhibiting said high voltage, wherein said high voltage inhibiting means periodically inhibits said high voltage.

4,318,153

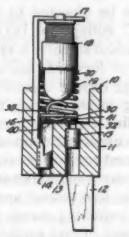
SNEAK CURRENT FUSE FOR TELEPHONE CIRCUITS

Michael Fasano, Syosset, N.Y., assignor to Porta Systems Corp., Syosset, N.Y.

Filed Jun. 9, 1980, Ser. No. 157,360

Int. Cl.³ H02H *3/22*

U.S. Cl. 361—119 **3 Claims**



1. In a telephone protector module, including a housing and conductive terminals for interconnecting tip and ring circuits from an individual subscriber station to telephone office equipment, said module having heat sensitive means for grounding said tip and ring circuits upon the occurrence of a continuous excess current surge, the improvement comprising: switch means interconnecting said conductive terminals and said heat sensitive means, and controlled by said heat sensitive means such that said switch is normally closed to provide continuity when said heat sensitive means is in unfired condition, the firing of said heat sensitive means serving to open that portion of a respective tip or ring circuit leading to station equipment, while simultaneously grounding that portion of said respective circuit leading to telephone office equipment.

4,318,154

FAST RELAY TURN ON CIRCUIT WITH LOW HOLDING CURRENT

Robert P. DePuy, Cherry Hill, N.J., assignor to General Electric Company, Philadelphia, Pa.

Filed Oct. 16, 1980, Ser. No. 197,397

Int. Cl.³ H01H *47/32*

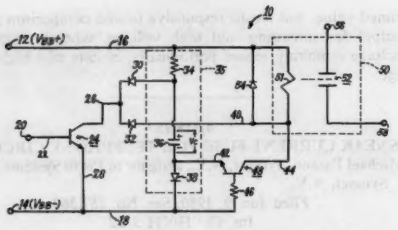
U.S. Cl. 361—155 **7 Claims**

1. A drive circuit responsive to an applied electrical signal

for controlling the actuation of a relay having an energizing coil with a first and a second end arranged across an output stage of the circuit, said circuit being adapted to be energized by a D.C. voltage present between a positive and a negative potential, said circuit comprising;

a charging circuit comprising a serially-arranged first resistor, a capacitor, and a first diode, said first resistor having a first end connected to said positive potential, said first diode having its cathode connected to said negative potential,

a second and a third diode, said second and third diodes each having their cathodes connected together at a first end, said second diode having its anode connected to a second end of said first resistor and to a first end of said capacitor, said third diode ectrode being connected to said negative potential, said second electrode being adapted to receive said electrical applied signal, and said third electrode being coupled to the connected cathodes of said second



and third diodes, said first switching means being arranged so that (i) when in its nonconductive state it allows said capacitor to be charged to a voltage substantially equal to said D.C. voltage and (ii) upon the occurrence of said applied electrical signal it is rendered conductive and supplies a path to forward-bias said second diode and initiate a discharge of said capacitor;

a second switching means having first, second and third electrodes, said first electrode being connected to a second end of said capacitor, said second electrode being coupled by a second resistor to said negative said energizing coil for dissipating inductive stored energy;

said charging circuit, said second and third diodes, and said first and second switching means being arranged so that upon the occurrence of said applied electrical signal, both of said first and second switching means are rendered conductive and an initial voltage equal to the sum of the charged potential of said capacitor and said D.C. voltage is applied across said energizing coil to actuate said relay.

4,318,155

RESIDUAL MAGNETISM REVERSING CIRCUIT FOR AN ELECTROMAGNETIC CLUTCH

Steven L. Thomas, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 20, 1980, Ser. No. 161,288
Int. Cl.³ H01H *47/02*
U.S. Cl. 361—156 **3 Claims**

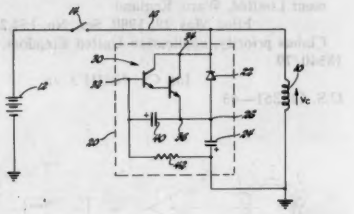
1. A control circuit for an electromagnetic clutch having an electrical coil and a pair of engageable members positioned in response to the energization of said coil, said circuit comprising in combination:

a source of direct current;

first switch means for selectively connecting or disconnecting said coil and said source;

a first series circuit comprising a capacitor and a free-wheeling diode connected in parallel to said coil so that inductive energy stored in said coil when said source is disconnected therefrom is circulated through said first series circuit to charge said capacitor and reduce the inductive stress applied to said first switch means, said diode being connected relative to said source and said capacitor in a manner to isolate said capacitor from said source to prevent said source from charging said capacitor while source is connected to said coil, whereby said capacitor does not affect the energization of said coil;

second switch means connected in parallel with said free-wheeling diode and effective when biased to a conductive state to complete a second series circuit comprising said capacitor and said coil; and



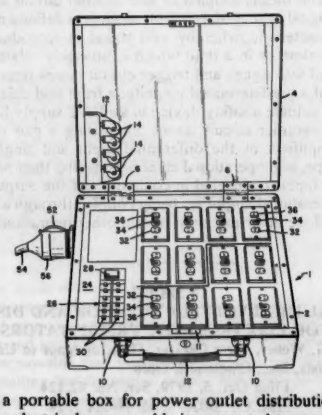
voltage responsive means for biasing said second switch means to a conductive state when the voltage across said capacitor exceeds a desired value, whereby the energy stored in said capacitor following disconnection of said source from said coil is reapplied to said coil in a direction opposite to that applied by said source for relieving the residual magnetism in the engageable members of said clutch to positively disengage said members following disconnection of said source from said coil.

4,318,156

PORTABLE DISTRIBUTION BOX

Michael J. Gallagher, 623 Cumberland St., Lebanon, Pa. 17046

Filed Apr. 30, 1980, Ser. No. 145,024
Int. Cl.³ H02B *1/04*
U.S. Cl. 361—358 **8 Claims**



1. In a portable box for power outlet distribution inside which an electrical power cable is connected to a neutral bus and also connected in series to a power bus, and plural outlets are coupled electrically to the neutral bus and through secondary circuit breakers to the power bus, the improvement comprising:

a panel mounted, first wiring module including said main circuit breaker and said secondary circuit breakers,

a plurality of panel mounted, second wiring modules, each including an aforesaid outlet and a pilot light and a manually actuated switch,

each said switch being electrically in series with a respective said secondary circuit breaker and said pilot light and said outlet of the same wiring module,

said first wiring module and said second wiring modules being mounted on one panel comprising a surface of said portable box,

an inlet connection with said electrical power cable remote from said one panel,

a cover hinged to said portable box and closeable over said panel, and

means for locking said cover over said panel.

4,318,157

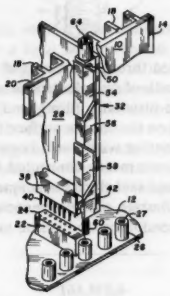
APPARATUS FOR MOUNTING CIRCUIT CARDS

William J. Rank, Minneapolis, and Michael J. Whalen, Rosemont, both of Minn., assignors to Control Data Corporation, Minneapolis, Minn.

Filed Jun. 6, 1980, Ser. No. 156,967

Int. Cl.³ H05K *7/20*

U.S. Cl. 361—386 **11 Claims**



1. Apparatus removably mounting a printed circuit card assembly to a chassis; said chassis including a base, two opposed walls, means defining a plurality of channels in said walls, a row of female electrical contacts mounted to the base, and an anchoring means for anchoring at least one shaft, said anchoring means mounted to the base proximate each end of said row; said printed circuit card assembly including a heat sink, a printed circuit card mounted to the heat sink, a mating row of pin contacts mounted to said assembly and adapted to engage said female contacts thereby establishing electrical contact between said chassis and circuit card, and a bracket mounted to said assembly proximate each end of said mating row; wherein the improvement comprises:

an elongated shaft carried in each bracket and releasably engageable with said anchoring means, contact between each shaft and said anchoring means, prior to full engagement therewith, aligning said pin contacts with said female contacts whereby subsequent movement of each shaft to full engagement with said anchoring means simultaneously causes said pin contacts and female contacts to engage; a plurality of ramps carried on each shaft and moveable laterally thereof; and a forcing means, mounted on each shaft and moveable longitudinally thereof, for urging the ramps laterally outward in opposite directions, thereby urging at least one of said ramps and said assembly against opposite wall portions of one of said channels to frictionally secure the assembly in said chassis.

4,318,158

BULBHOLDER AND FILTER ASSEMBLY

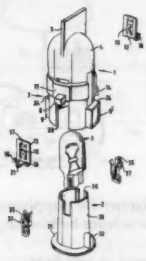
Malcolm J. Livermore, Boreham, and John C. Hobbs, Loughton, both of England, assignors to Ford Motor Company, Dearborn, Mich.

Filed Apr. 9, 1979, Ser. No. 28,133

Claims priority, application United Kingdom, May 30, 1978, 24519/78

Int. Cl.³ G01D *11/28*

U.S. Cl. 362—29 **6 Claims**



6. An instrument cluster comprising a housing in which one or more instruments are mounted for viewing from a front surface of the housing, a supporting wall through which electrical and mechanical connections pass to the instruments and a bulbholder assembly mounted in an aperture in said supporting wall with a bulbholder projecting from the rear surface thereof;

said bulbholder assembly comprising a mounting carrying a coupling toward one end, whereby said one end may be inserted into said aperture in said supporting wall and secured therein, and said bulbholder being removably mounted in said one end of said mounting and capable of being inserted into said aperture with said mounting as a unit inserted into said aperture with said mounting as a unit from one side of said supporting wall to project through said aperture for removal from said mounting from the other side of said supporting wall, a light transmitting filter being carried on the end of said mounting opposite said coupling, said filter being formed integrally with said mounting and including an integral tab finger grip;

said mounting having an internal surface and carrying a first electrical contact on said internal surface;

said bulbholder having an external surface and carrying a second electrical contact on said external surface;

said bulbholder being retained in said mounting by engagement of said first and second electrical contacts, at least one of said first and second electrical contacts being resiliently movable to allow said holder to be withdrawn from said mounting;

said mounting being made of a light transmitting plastic material and including an integral finger grip, said finger grip being in the form of an outwardly projecting tab;

said coupling comprising a first and a second pair of lugs which project radially outward away from said mounting, said lugs of each pair being circumferentially offset from each other by about 90° and spaced axially from each other to receive between themselves said supporting wall;

said bulbholder comprising a frusto conical tube carrying a flange means for acting as a finger grip and two radial projections extending outwardly from said tube adjacent the edge of said flange; and

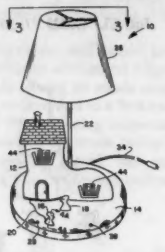
said coupling including a slot for receiving said radial projections and acting as followers during insertion of said bulbholder into said mountin

4,318,159

MAGNETIC LIGHT FIXTURE

Melvin C. Kaisner, 19309 U.S. 41 North, Lutz, Fla. 33549

Filed Feb. 6, 1980, Ser. No. 119,093
Int. Cl.³ F21P *1/02*
U.S. Cl. 362—124 **7 Claims**



1. A lamp fixture for supplying electrical power from a power source to a lamp bulb, comprising in combination:
a base;
a figurine mounted to said base;
a light pole mounted relative to said base;
a lamp socket mounted to said light pole;
a switch means;
means for connecting said switch means to said lamp socket;
a trigger means for triggering said switch means;
means for connecting said trigger means to said switch means enabling the switch means to supply power from the power source to said lamp socket while said switch means is being triggered by said trigger means;
a second figurine for actuating said trigger means;
said second figurine being disassociated from said trigger means such that said second figurine is not mechanically connected to said trigger means; and
said second figurine being movable in close proximity to said trigger means enabling said second figurine to actuate said trigger means while said second figurine is in a close proximity to said trigger means.

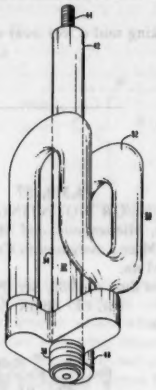
4,318,160

FLUORESCENT LAMP CONVERSION UNIT

Thomas E. Dooley, Clifton, and Edward W. Morton, Teaneck, both of N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 28, 1979, Ser. No. 98,107
Int. Cl.³ F21S *5/00*
U.S. Cl. 362—216 **4 Claims**

1. A fluorescent lamp conversion unit for use in combination with a residential incandescent-type lamp fixture, said fixture comprising a base member having electrical conductors associated therewith, socket means vertically projecting from the upper portion of said base member and operatively receiving said electrical conductors, said fixture intended for operation with a lamp shade of predetermined dimensions and having a supporting frame means proximate the upper end thereof including a central member having provided therein an aperture of predetermined size, said fluorescent lamp conversion unit comprising:
lamp and lamp shade supporting means comprising a rigid hollow elongated member adapted to be vertically disposed and having at the lower end thereof an electrical adapter means adapted to mountably engage said socket means, said supporting means having at the upper end thereof a support member extending colinearly from said hollow elongated member and adapted to project through said aperture provided in said central member of said lamp shade frame means to support said lamp shade, a retaining member sized to cooperate with said support member to secure said frame means of said lamp shade to said hollow elongated member, housing means affixed to said rigid hollow elongated member proximate at least one end thereof, a fluorescent lamp of the compact type supported by said lamp and lamp shade supporting means, said lamp having an elongated envelope which has a double-U-bend to present a compact design thereby enabling said lamp to be enclosed by said lamp shade, said lamp including a pair of thermionic electrodes operatively mounted within said envelope proximate the ends thereof, a pair of lead-in



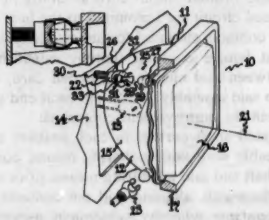
conductors sealed through the ends of said envelope and connecting to each of said electrodes, said envelope closing a discharge-sustaining filling and having phosphor material carried on the interior surface thereof, the ends of said lamp terminating within said housing means, current carrying conductor means connected in circuit between said electrodes and said electrical adapter means, and lamp starting and ballasting means connected in circuit with said electrical conductors to operate said lamp.

4,318,161

SNAP IN COUPLING ASSEMBLY FOR A VEHICLE HEADLAMP HAVING A TRIM RIM INTEGRAL THEREWITH

Bruce E. Shanks, Chesterland, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 16, 1979, Ser. No. 85,353
Int. Cl.³ H01R *33/00*
U.S. Cl. 362—226 **10 Claims**



1. A sealed beam vehicle headlamp assembly comprising a lamp unit having a light source sealed within and focused relative to an envelope including a reflector and a light transmissive lens for producing a light beam having an axis substantially parallel to the optical axis of said lamp unit, a rim integrally molded with said envelope, three couplers directly and fixedly secured to said rim in a triangular configuration, each of said couplers having a curved mating surface which is sub-

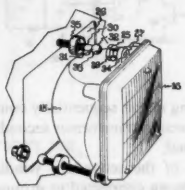
stantially centered for pivotal movement about a point, the points defining a plane transverse to the axis of said beam.

4,318,162

SNAP IN COUPLING ASSEMBLY FOR A VEHICLE HEADLAMP

Jiri G. Sip, Brunswick, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 16, 1979, Ser. No. 85,354
Int. Cl.³ H01R *33/00*
U.S. Cl. 362—226 **10 Claims**



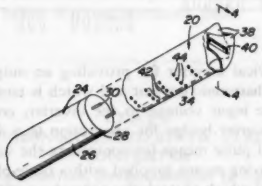
1. A sealed beam vehicle headlamp assembly comprising a lamp unit having a light source sealed within and focused relative to an envelope including a reflector and a light transmissive lens for producing a light beam having an axis substantially parallel to the optical axis of said lamp unit, three couplers directly and fixedly secured to the exterior surface of said envelope in a triangular configuration, each of said couplers having a curved mating surface which is substantially centered for pivotal movement about a point, the points defining a plane substantially perpendicular to the axis of said beam.

4,318,163

PROTECTIVE SHIELD FOR ULTRAVIOLET LAMPS

Emanuel Bryan, 2743 Rossiter Ave., Roslyn, Pa. 19001

Filed Dec. 29, 1980, Ser. No. 220,655
Int. Cl.³ F21V *11/00*
U.S. Cl. 362—359 **10 Claims**



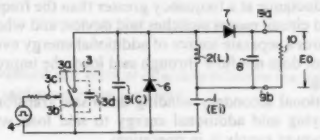
1. A protective shield for a fluorescent tube having a pair of end caps through which at least one electrical contact extends, said shield being formed of a flexible plastic material and comprising a sleeve having a pair of open ends, each of said ends including an opposed pair of lamps, each of said flaps including at least one opening therein, said sleeve being adapted to receive said tube closely therein with the flaps of each end being folded over each other to overlap and cover an associated end cap of said tube and with said contacts extending through the openings in said flaps.

4,318,164

HIGH FREQUENCY SWITCHING CIRCUIT HAVING PRESELECTED PARAMETERS TO REDUCE POWER DISSIPATION THEREIN

Toshihiro Onodera, Kunitachi; Youichi Masuda, Yokohama, and Akira Nakajima, Yokosuka, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Mar. 11, 1980, Ser. No. 129,405
Claims priority, application Japan, Mar. 15, 1979, 54/30480; Mar. 15, 1979, 54/30481; Mar. 15, 1979, 54/30482
Int. Cl.³ H02P *13/22*
U.S. Cl. 363—21 **4 Claims**



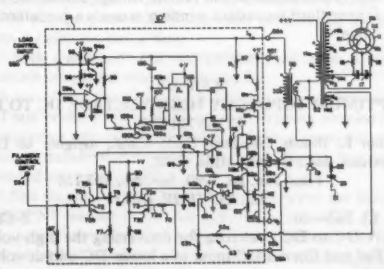
1. A switching circuit comprising an input power source; a switching element and an inductor connected in series across said input power source; a resonant capacitor connected in parallel with said switching element; a damper diode connected in parallel with said resonant capacitor, a load network coupled with said inductor and including a rectifying element and a smoothing capacitor; and a pulse source for applying switching pulses to said switching element to render said switching element ON or OFF, characterized in that a characteristic impedance $Z_o=\sqrt{L/C}$ defined by an inductance L of said inductor and a capacitance C of said resonant capacitor and the ratio T_{ON}/T of ON time T_{ON} and switching period T of said switching element are set such that the voltage across said switching element rises gradually up to at least a level which enables said rectifying element to be rendered conductive after said switching element is rendered OFF, and then gradually decays down to zero volt before said switching element is rendered ON by a switching pulse supplied from said switching pulse source, wherein the characteristic impedance Z_o ranges from 0.5 ohm to 500 ohms, the ratio E_o/E_i of voltage E_i of said input power source and an output voltage E_o of the switching circuit ranges 1 to 3, and the ratio T_{ON}/T of the ON duration T_{ON} of the switching element and the switching period T ranges from 0.05 to 0.5.

4,318,165

RESONANT-FLYBACK POWER SUPPLY WITH FILAMENT WINDING FOR MAGNETRON AND THE LIKE LOADS

William P. Korarumpf; John N. Park, both of Schenectady, N.Y., and De Y. Chen, Blacksburg, Va., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 21, 1980, Ser. No. 141,907
Int. Cl.³ H02P *13/18*; H05B *6/68*
U.S. Cl. 363—21 **14 Claims**



1. In a power supply of the resonant-flyback type for energizing a self-rectifying load, through which a current flows

only when a voltage of predetermined polarity and magnitude is exceeded thereacross, from a secondary winding of a transformer having a primary winding having a mutual inductance to said secondary winding, said primary winding being connected between an operating potential source and a controlled-current path of a switching device, said switching device also having an input terminal for receiving a signal from circuit means for controlling said controlled-current path between conduction of current in a first portion of each of a plurality of operating cycles and essentially non-conduction of current during a remaining portion of each of said operating cycles; and an electrical capacitance effectively connected in parallel across the mutual transformer inductance to resonate said mutual inductance at a frequency greater than the frequency at which said circuit means switches said device; and wherein the load requires a separate source of additional energy even when said current does not flow through said load, the improvement comprising:

an additional secondary winding upon said transformer for supplying said additional energy to said load whenever said power supply is in operation;

means for sensing the magnitude of current flowing through said controlled-current path of said switching device;

over-voltage sensing means including a third transformer secondary winding having a voltage thereacross substantially proportional to the instantaneous voltage appearing across said transformer primary winding;

said circuit means including:

a flip-flop logic element having a set S input, a reset R input and an output providing a signal having first and second levels respectively responsive to the presence of an enabling signal at said set S and said reset R inputs respectively;

first means receiving the flip-flop logic element output signal for respectively enabling and disabling current flow through said switching device controlled-current path responsive to the presence respectively of said first and second output levels;

astable multivibrator means for periodically providing said enabling level signal to said set S input of said flip-flop logic element;

second means for receiving a load control input signal having first and second levels respectively determining if current can or cannot flow through said controlled-current path;

third means coupled to said second means for preventing application of said enabling level signal to said set S input whenever said load control input signal is at said second level;

fourth means for providing an enabling level signal to said reset R input whenever the flow of current in said controlled-current path exceeds a predetermined magnitude, to terminate the flow of current in said controlled-current path whenever said current sensing means senses a current exceeding said predetermined magnitude; and

fifth means for reducing said predetermined magnitude of said fourth means whenever the voltage across said transformer third secondary winding exceeds a predetermined value.

4,318,166

OPTIMUM TOPOLOGY HIGH VOLTAGE DC TO DC CONVERTER

Gordon E. Bloom, Newbury Park, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Jun. 26, 1980, Ser. No. 163,126
Int. Cl.³ H02P *13/18*
U.S. Cl. 363—26 **5 Claims**

1. A DC to DC converter for converting the high voltage rectified and filtered DC input to a lower DC output voltage, comprising:

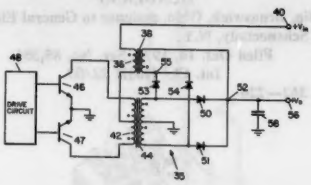
a first transformer having primary and secondary windings whose secondary to primary turns ratio is N_L;

a second transformer having center-tapped primary and secondary windings whose secondary to primary turns ratio is N_T equal to N_L;

an input terminal connected in series through said primary winding of said first transformer to the center tap of said primary winding of said second transformer;

first switching means sequentially connecting each of the ends of said second transformer primary winding to ground;

an output terminal;



second switching means sequentially connecting each of the ends of said second transformer secondary winding to said output terminal;

the center tap of the secondary winding of said second transformer being connected to ground;

third switching means connecting said secondary winding of said first transformer in series between said secondary winding of said second transformer and said output terminal; and

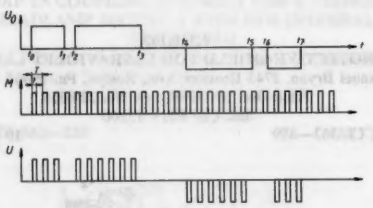
drive means for controlling said first switching means.

4,318,167

ELECTRICAL INVERTER WITH CONTROLLABLE OUTPUT VOLTAGE

Lennart Ängquist, Enköping, Sweden, assignor to Asea Aktiebolag, Vesteras, Sweden

Filed Jan. 22, 1980, Ser. No. 114,171
Claims priority, application Sweden, Feb. 5, 1979, 7900966
Int. Cl.³ H02M *1/12*
U.S. Cl. 363—41 **4 Claims**



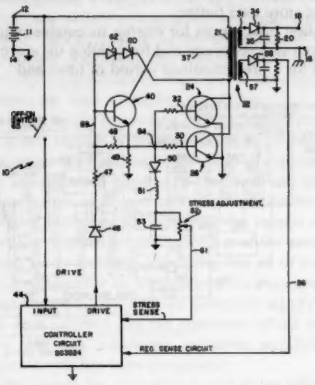
1. An electrical inverter for providing an output voltage having a low harmonic content and which is controllable in relation to the input voltage to the inverter, comprising a three-phase inverter bridge for connection to a d.c. voltage source, control pulse means for controlling the valves of the bridge, and mixing means supplied with a three-phase binary reference signal which controls the curve shape of the inverter output voltage for mixing the reference signal with a binary pulse train to produce a resultant signal, said reference signal comprising both fundamental commutations and additional commutations for reducing the harmonic content of the inverter output voltage, said binary pulse train having a controllable pulse-width ratio and a frequency which is higher than the frequency of the inverter output voltage, said resultant signal being supplied to said control pulse means so that the inverter output voltage comprises the product of the reference signal and the binary pulse train.

4,318,168

OVER STRESS SENSE CIRCUIT FOR FLYBACK POWER SUPPLY

Merle W. Faxon, Kingston, N.H., assignor to Raytheon Company, Lexington, Mass.

Filed Jun. 27, 1980, Ser. No. 163,679
Int. Cl.[3] H02H 7/122
U.S. Cl. 363—56 15 Claims



1. A protective circuit for preventing the load current in a switching power supply from exceeding a predetermined limit comprising:

a power transistor coupled to an output load circuit;

a drive transistor coupled to the input of said power transistor;

a source of drive voltage pulses applied to the input of said drive transistor to provide a drive voltage;

circuit means including a Baker clamp diode coupled from the output load circuit of the power transistor to the input of said drive transistor to provide a clamped drive voltage;

means for sensing the average voltage increase of said clamped drive voltage at the output of said drive transistor applied to the input of said power transistor above a predetermined limit in response to non-conductivity of said Baker clamp diode upon termination of saturation of said power transistor during overload of said power transistor; and

means in response to said increase in drive voltage above said limit to decrease the width of said drive voltage pulses to reduce the input of said power transistor, whereby the on-time of said power transistor is reduced to a value below said predetermined limit.

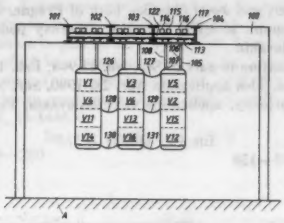
4,318,169

SUSPENSION-MOUNTED STATIC ELECTRICAL CONVERTER

Karl E. Olsson, Ludvika, Sweden, assignor to Asea Aktiebolag, Vesteras, Sweden

Filed Mar. 19, 1980, Ser. No. 131,725
Claims priority, application Sweden, Mar. 27, 1979, 7902706
Int. Cl.[3] H02M 7/757
U.S. Cl. 363—123 17 Claims

1. A static electrical converter for high voltage direct current power transmission comprising at least one valve assembly having a single valve or a plurality of electrically series-connected valves, each valve comprising a plurality of electrically series-connected rectifiers, and suspension means at the upper end of said valve assembly for permanently mounting the valve assembly suspended from a supporting structure, said suspension means comprising resilient means permitting rela-



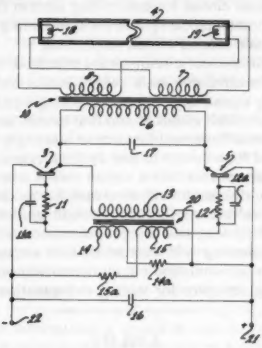
tive movement in a vertical direction between the valve assembly and said supporting structure.

4,318,170

POWER INVERTER OSCILLATOR CIRCUIT

Rolando V. Cabalfin, 7321 El Domino Way #2, Buena Park, Calif. 90620

Filed Jan. 12, 1981, Ser. No. 224,386
Int. Cl.[3] H02M 7/537
U.S. Cl. 363—133 3 Claims



1. A DC to AC power inverter circuit comprising:

a positive charged terminal and a negative charged terminal;

a first transformer having a primary coil and a secondary coil;

a capacitor coupled in parallel with said primary coil;

a PNP transistor and a NPN transistor each having an emitter, a collector and a base;

said both transistors and said primary coil form a series circuit coupled across said terminals;

each one of said transistors being coupled to a respective end of said primary coil and said transistors being coupled to a respective one of said terminals to form a series circuit;

a second transformer having a primary coil and a first and a second secondary coils;

said first secondary coil being coupled between the base of said PNP transistor and said positive terminal;

said second secondary coil being coupled between the base of said NPN transistor and said negative terminal; and

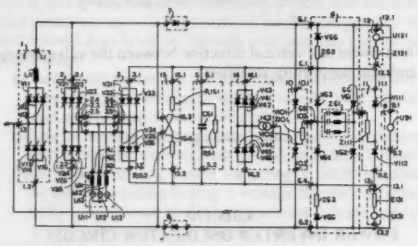
said primary coil of said second transformer being coupled between the emitter of one of the transistors and said terminal which is coupled to the other transistor.

4,318,171

METHOD OF THREE COMMUTATION ON RECTIFIERS AND OF INVERTED ELECTRIC CURRENT CONVERTERS

Jiri Winkler, and Josef Cibulka, both of Prague, Czechoslovakia, assignors to CKD PRAHA, Oborovy podnik, Prague, Czechoslovakia

Continuation-in-part of Ser. No. 11,948, Feb. 13, 1979, abandoned. This application Apr. 28, 1980, Ser. No. 144,570
Claims priority, application Czechoslovakia, Feb. 14, 1978, 956-78
Int. Cl.³ H02M *7/515*
U.S. Cl. 363—138 **7 Claims**



1. In a cyclically operable converter system having AC circuits having at least a first and second circuit associated, respectively, with a first and second AC phase, a DC circuit, a load, and controllable main switch means connected in said first and second circuit for controlling current flow therein, a three stage commutation system for transferring current from said first to said second circuit comprising

auxiliary disconnect circuit means operative independently of said controllable main switch means for generating a blocking signal, applying said blocking signal to said controllable switch means of said first circuit, and taking over said current from said first circuit starting at a first predetermined time instant in said cyclical operation;

and auxiliary accumulation circuit means connected to said auxiliary disconnect circuit means for receiving said current therefrom starting at a second predetermined time instant following said first predetermined time instant, and for transferring said current to said second phase, said auxiliary accumulation circuit means comprising an accumulating capacitor for storing commutation energy.

4,318,172

STORE DATA BUFFER CONTROL SYSTEM

Naoki Yamada, Hadano, and Kenichi Wada, Zama, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 26, 1979, Ser. No. 33,449
Claims priority, application Japan, May 9, 1978, 53-54727
Int. Cl.³ G06F *13/00*
U.S. Cl. 364—200 **7 Claims**

1. A store data buffer control for a system in which data to be stored from a processor to a memory is temporarily and sequentially stored in a plurality of store data buffers and the stored data is then stored sequentially in said memory from said store data buffers, comprising:

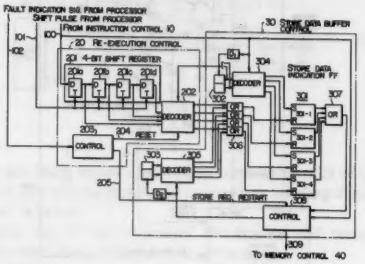
indication means provided for each of said store data buffers to indicate the presence or absence of data for each store data buffer;

first designation means responsive to a store request signal from said processor for designating sequentially that one of said store data buffers into which data from the processor is to be next stored, said first designation means including means for causing the indication means corresponding to the designated store data buffer to indicate the presence of data;

second designation means for designating sequentially one of said store data buffers from which data is to be transferred into said memory;

first control means responsive to an indication of the presence of data by at least one of said indication means for instructing data transfer from the store data buffer designated by said second designation means to the memory, and simultaneously for causing the indication means corresponding to the store data buffer designated by the second designation means to indicate the absence of data for that store data buffer;

store request hold means for storing successive request signals from said processor and for holding the store request signals for a predetermined period of time; and



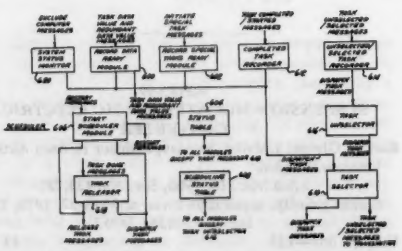
indication changing means connected to said first designation means and said store request hold means and responsive to occurrence of a fault in the processor which may result in the storing of invalid data in at least one of said store data buffers in response to the indication of the presence of data by at least one of said indication means for causing said indication means to indicate the absence of data for those store data buffers which have received data on the basis of the request signals held in said store request hold means, whereby said first control means will not recognize the presence of data in those store data buffers and therefore will not instruct a data transfer of any data stored therein, thereby to prevent the transfer of invalid data to said memory.

4,318,173

SCHEDULER FOR A MULTIPLE COMPUTER SYSTEM

Morris D. Freedman, Southfield; Arliss E. Whiteside, Royal Oak, and Alexander M. Rothschild, Ann Arbor, all of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed Feb. 5, 1980, Ser. No. 118,812
Int. Cl.³ G06F *15/16*
U.S. Cl. 364—200 **14 Claims**



1. A scheduler in each computer in a multiple computer system wherein each computer is assigned a set of tasks it is capable of selecting and executing in a predetermined order of priority and each task is assigned to more than one computer and wherein each computer is assigned an execution priority to

resolve multiple selection of the same task and each computer includes an applications computer for executing the assigned tasks and for generating a signal signifying it has completed the execution of a task and a task communicator interfacing the scheduler and the applications computer and storing data variables required for the execution of the tasks, said task communicator operative to assemble the data variables required for the execution of each task identified in a task dispatch message and to release to the applications computer the assembled data variables in response to a task release message and to send messages to all of the computers in the system, these messages containing the values of the data variables produced by the applications computer in the execution of the completed task, each scheduler comprising:

status table means for storing current status information for each task capable of being executed by its own computer, said status table storing in the order of execution priority, the identification number of each task and its associated status information, said status information including data variable indicators for signifying the receipt of each data variable required for the execution of the associated task, a task ready indicator signifying that all of the data variables required for the execution of the associated task have been received, task selected indicators signifying the task has been selected and the computer which selected that task, and task completed indicators signifying that the selected task has been completed;

recorder means for recording in said status table means the status information contained in the messages received from all of the computers in the multiple computer system, said recorder means setting said data variable indicators to signify the receipt of each data variable required for the execution of that task, setting said task ready indicator to signify all the required data variables for that task have been received, setting said task selected indicator to signify the identity of the computer which selected the task, and setting said task completed indicator to signify the selected task has been completed;

means for generating a task select signal in response to said recorder means setting said task ready indicator for the first time in response to a received message;

task selector means for selecting from said status table means the highest priority task having its task ready indicator set and none of its task selected indicators set in response to said task select signal, to generate said dispatch task message identifying the selected task to said task communicator, and to send to all of the computers a message containing the identity of the selected task;

task unselector means connected to said status table means and said task selector means and responsive to a message from a computer having a higher execution priority and containing an identification of a selected task which is the same as a task previously selected by said task selector means and which does not have its task completed indicator in said status table means set signifying the task has been completed, for recording in said status table means that the task is selected by the computer identified in the message and that the task is unselected by its own computer, and for generating said select task signal enabling said task selector means to select a new task and wherein said message sent to all of the computers by said task selector means further includes the identity of the unselected task; and

task releaser means for generating said task release message in response to the signal received from the applications computer signifying it has completed the execution of the preceding task, said task release message enabling the task communicator to release the selected task and the assembled task data variables to the applications computer.

4,318,174

MULTI-PROCESSOR SYSTEM EMPLOYING JOB-SWAPPING BETWEEN DIFFERENT PRIORITY PROCESSORS

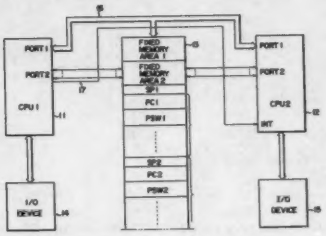
Seigo Suzuki, Yokohama, and Seiji Eguchi, Kawasaki, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Continuation-in-part of Ser. No. 41,199, May 21, 1979, abandoned, which is a continuation of Ser. No. 747,213, Dec. 3, 1976, abandoned. This application Sep. 19, 1979, Ser. No. 76,844

Claims priority, application Japan, Dec. 4, 1975, 53-144628; Dec. 4, 1975, 53-144630

Int. Cl.[3] **G06F** *9/46, 15/16*

U.S. Cl. 364—200 **3 Claims**



1. A multi-processor system coupled to an external I/O device, said multi-processor system comprising:

(a) an external memory;

(b) a high priority processor executing a first stored program and connected by a data bus to said external memory, said high priority processor including

(i) a first internal memory containing linkage information, including program status data and instructions, for the first stored program being executed by said high priority processor,

(ii) first means coupled to said first internal memory for transferring said linkage information between said first internal memory and said external memory via said data bus,

(iii) means coupled to said first means for receiving an interrupt signal from said I/O device and for causing said first means to store said linkage information corresponding to said first stored program into said external memory, and

(iv) means coupled to said interrupt signal receiving means for generating a swap interrupt signal after said linkage information is stored in said external memory and for causing said high priority processor to execute a program supplied by said I/O device; and

(c) a low priority processor executing a second stored program and connected by said data bus to said external memory, said low priority processor including:

(i) a second internal memory containing linkage information, including program status data and instructions, for the second stored program being executed by said low priority processor,

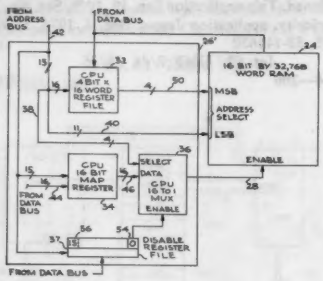
(ii) second means coupled to said second internal memory for transferring said linkage information between said second internal memory and said external memory via said data bus,

(iii) swap interrupt receiving means coupled to said second means and responsive to said swap interrupt signal from said high priority processor for causing said second means to store said linkage information corresponding to said second stored program into said external memory and to retrieve said linkage information corresponding to said first stored program from said external memory into said second internal memory of said low priority processor, thereby causing said low priority processor to execute said first program.

4,318,175
ADDRESSING MEANS FOR RANDOM ACCESS MEMORY SYSTEM

Kenneth R. Hawley, Ventura, Calif., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Aug. 13, 1979, Ser. No. 66,242
Int. Cl.³ G06F 9/36
U.S. Cl. 364—200 **10 Claims**



1. In a data processing system including a central processing unit coupled to a data bus and an m bit address bus, an improved memory system coupled to said data bus and address bus, comprising:

means for partitioning an m bit address into subsets of n bits and (m−n) bits;

2^n memory modules each including up to 2^m memory locations;

2^n substantially identical address translation units, each coupled to a different memory module and each including a map register containing 2^n locations, each map register location defining a first or second state;

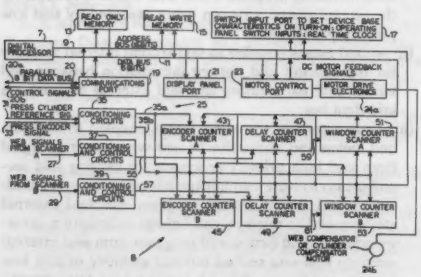
enabling means responsive to said subset of n address bits for selecting one of said 2^n map register locations in each of said address translation units and for enabling the memory module coupled to an address translation unit containing a selected location defining a first state; and

means responsive to an m bit address on said address bus for accessing one of the 2^m locations in said enabled memory module.

4,318,176
COMPUTERIZED PRESS CONTROLS

Larry J. Stratton, Catlin; Richard A. Norini, Danville; Peter G. Davis, Danville; Steve M. Dyskievicz, Danville; Frederic W. Cowap, Danville; Roger L. Haskin, Urbana; Mark B. Gagner, Mokena, all of Ill., and Thomas M. Mynett, Huntsville, Ala., assignors to HurletronAltair, Inc., Danville, Ill.

Filed Mar. 3, 1980, Ser. No. 126,823
Int. Cl.³ G06F 15/46; B65H 23/18
U.S. Cl. 364—469 **34 Claims**


READ ONLY MEMORY
READ WRITE MEMORY
SWITCH INPUT PORT TO SET DEVICE BASE CHARACTERISTICS ON TURN-ON; OPERATING PANEL SWITCH INPUTS; REAL TIME CLOCK
DIGITAL PROCESSOR
ADDRESS ASSIGNMENTS
DATA BUS BUFFERS
DC MOTOR FEEDBACK SIGNALS
PARALLEL 16 BIT DATA BUS
COMMUNICATIONS PORT
DISPLAY PANEL PORT
MOTOR CONTROL PORT
MOTOR DRIVE ELECTRONICS
CONTROL SIGNALS
PRESS CYLINDER REFERENCE SIG.
PRESS ENCODER SIGNAL
WEB SIGNALS FROM SCANNER A
WEB SIGNALS FROM SCANNER B
CONDITIONING CIRCUITS
CONDITIONING AND CONTROL CIRCUITS
ENCODER COUNTER SCANNER A
DELAY COUNTER SCANNER A
WINDOW COUNTER SCANNER A
ENCODER COUNTER SCANNER B
DELAY COUNTER SCANNER B
WINDOW COUNTER SCANNER B
WEB COMPENSATOR OR CYLINDER COMPENSATOR MOTOR

10. A control system for determining the relative location of members of a plurality of marks previously placed on a moving web, with respect to a set point, the marks are sensed by a web sensor as the web moves in a selected direction across a rotating cylinder, the control system comprising:

means to establish a length of an inspection window, corresponding to a selected amount of cylinder rotation, for each revolution of the cylinder;

means to enable the web sensor, starting when a reference mark on the cylinder is at a previously selected point during the present rotation of the cylinder, and for an amount of rotation corresponding to said length of said inspection window;

means for determining the location of a sensed mark from said plurality of marks on the web sensed during the time interval when the web sensor is enabled;

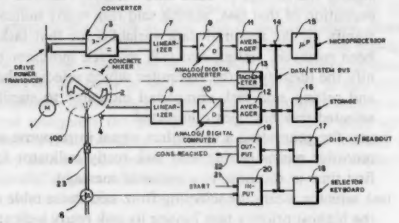
means for determining a selected point to be used to enable the web sensor during the next revolution of the cylinder;

means for comparing the set-point to said determined location of the sensed mark.

4,318,177
METHOD OF FEEDING WATER TO A CONCRETE MIX

Joachim Rapp, Weingarten, and Peter Bittmann, Gaggenau, both of Fed. Rep. of Germany, assignors to Elba-Werk Maschinen-Gesellschaft mbH & Co., Ettlingen, Fed. Rep. of Germany

Filed Dec. 20, 1979, Ser. No. 105,734
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1978, 2855324
Int. Cl.³ G06F 15/20
U.S. Cl. 364—502 **7 Claims**



1. A method of controlling the water added to concrete batches, comprising the steps of:

(a) determining for a given concrete recipe and batch size, while mixing same, a series of empirical values of water quantity and consistency of the resulting mix by initially feeding a quantity of water to the batch reduced by an amount equivalent to the moisture content of the aggregates of the batch at maximum intrinsic moisture content and thereafter incrementally adding water while measuring the consistency after each water addition;

(b) storing said values for the respective recipe and batch size; and

(c) for the addition of water to a further batch of said recipe, while mixing the further batch:

(i) adding an initial quantity of water to said further batch which is not reduced by the quantity of water equivalent to the moisture contents of the aggregates,

(ii) measuring the consistency of the further batch after the initial addition of water thereto,

(iii) interpolating between stored water values corresponding to stored consistency values neighboring the measured consistency of step (ii) to obtain a first water quantity and interpolating between stored water values corresponding to stored consistency values for a set point consistency of the further batch to obtain a second water quantity, and obtaining an additional water quan-

tity from the difference between said second and first water quantities, and

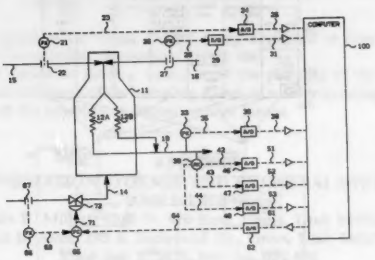
(iv) adding said additional water quantity to said further batch in a single increment.

4,318,178

CONTROL OF A CRACKING FURNACE

William S. Stewart; Gary L. Funk, both of Bartlesville, Okla., and Warren H. Huang, Taipei, Taiwan, assignors to Phillips Petroleum Co., Bartlesville, Okla.

Filed May 28, 1980, Ser. No. 154,165
Int. Cl.³ G06F *15/46*; C10G *9/36*
U.S. Cl. 364—502 **17 Claims**



9. A method for substantially maximizing the performance index of a cracking furnace in which a mixture of a feed stream and a diluent fluid are cracked to produce a gaseous mixture which contains the cracked components of said feed stream and contains said diluent fluid, said method comprising the steps of:

establishing a first signal representative of the actual ratio of the concentration of a first component in said gaseous mixture to the concentration of a second component in said gaseous mixture;

establishing a second signal representative of the ratio of the concentration of said first component in said gaseous mixture to the concentration of said second component in said gaseous mixture required to substantially maximize the performance index of said cracking furnace;

comparing said first signal and said second signal and establishing a third signal responsive to the difference between said first signal and said second signal; and

supplying heat to said cracking furnace in response to said third signal to thereby substantially maximize the economic value of said gaseous mixture.

4,318,179

THRUST BEARING MISALIGNMENT MONITOR

Jens Kure-Jensen, Schenectady, and Adrian Missana, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 2, 1980, Ser. No. 155,379
Int. Cl.³ G01M *13/04*
U.S. Cl. 364—506 **9 Claims**

1. Apparatus for continuously monitoring the state of alignment between a flow-lubricated thrust bearing and an associated rotating shaft, comprising:

a first temperature sensor disposed on said bearing for providing a signal T_1 indicative of the bearing temperature at a first position thereon;

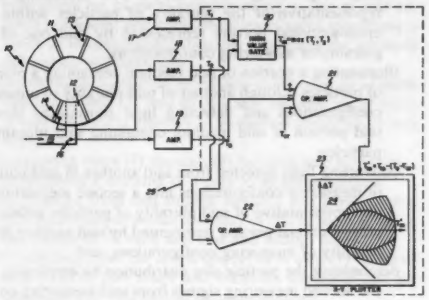
a second temperature sensor disposed on said bearing for providing a signal T_2 indicative of the bearing temperature at a second position thereon, said first and second positions being substantially diametrically opposite each other;

a third temperature sensor disposed within a lubricant flow stream to said bearing for providing a signal T_o indicative of the temperature of said lubricant flow stream;

a high value selector adapted to receive temperature signals T_1 and T_2 and operative to produce an output signal T_m representative of the higher temperature of T_1 or T_2;

a first signal subtractor means adapted to receive signals T_m and T_o and operative to produce an output signal T_m' representative of the difference between T_m and T_o;

a second signal substractor means adapted to receive signals T_1 and T_2 and operative to produce an output signal ΔT representative of the difference between T_1 and T_2; and



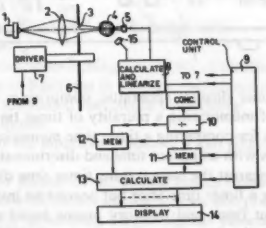
means simultaneously displaying values of T_m' and ΔT for comparison with a first predetermined set of pairs of said T_m' and ΔT values defining normal shaft-to-bearing alignment and with a second predetermined set of pairs of said T_m' and ΔT values defining abnormal shaft-to-bearing alignment, said displayed values of T_m' and ΔT assuming a correspondence with said first set of pairs or with said second set of pairs depending on the state of the alignment.

4,318,180

METHOD AND APPARATUS FOR INDICATING THE SIZE DISTRIBUTION OF PARTICLES IN A FLOWING MEDIUM

Inge J. Lundqvist, Spånga; Jan G. T. Pettersson, and Gerdt H. Fladda, both of Täby, all of Sweden, assignors to Svenska Traforskningsinstitutet, Sweden

Filed Jun. 11, 1979, Ser. No. 47,002
Claims priority, application Sweden, Jun. 15, 1978, 7806922
Int. Cl.³ G06G *7/48*; G01N *21/26*
U.S. Cl. 364—555 **32 Claims**



1. A method of determining particle size distribution with respect to fraction classes in the direction of flow in a flowing medium containing particles comprising the steps of:

establishing a plurality of measuring configurations for illuminating portions of said medium containing a plurality of particles and detecting light transmitted through said portions of said medium containing said plurality of particles, each of said plurality of measuring configurations

exhibiting a different resolution for illuminating portions of said medium and detecting light transmitted therethrough representing differing cross-sectional portions of said medium, each differing cross-sectional portion of said medium containing a plurality of particles;

illuminating a portion of said medium containing a plurality of particles through one of said plurality of measuring configurations and detecting light transmitted through said portion of said medium containing said plurality of particles;

converting light detected from said one of said plurality of measuring configurations into a first measuring signal representative of the plurality of particles within said cross-sectional portion represented by said one of said plurality of measuring configurations;

illuminating a portion of said medium containing a plurality of particles through another of said plurality of measuring configurations and detecting light transmitted through said portion of said medium containing said plurality of particles;

converting light detected from said another of said plurality of measuring configurations into a second measuring signal representative of said plurality of particles within said cross-sectional portion represented by said another of said plurality of measuring configurations; and

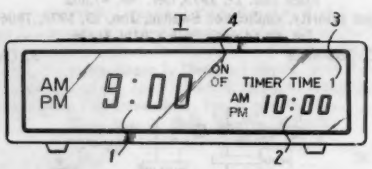
determining the particle size distribution by employing first and second measuring signals from said measuring configurations obtained during a run of said medium and sensitivity coefficients of said measuring signals, each of said coefficients being dependent upon a measuring configuration of a fraction class.

4,318,181

TIMER DISPLAY APPARATUS

Ryuichi Kawakami, Kanagawa, and Kenichi Nakazawa, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 16, 1980, Ser. No. 112,455
Claims priority, application Japan, Jan. 26, 1979, 54-8593
Int. Cl.³ H01H *43/00*
U.S. Cl. 364—569 **2 Claims**



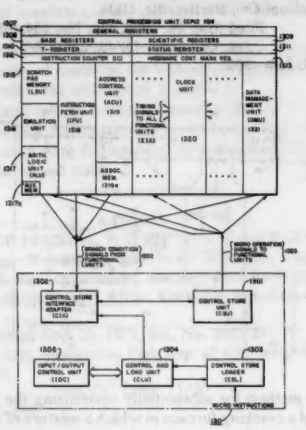
1. A timer display apparatus, comprising: memory means capable of memorizing a plurality of timer times; discriminating means for comparing a timer time memorized in said memory means with an instant time and discriminating a timer time after but nearest the instant time; timer time display means for displaying a timer time after but nearest an instant time which is read out from said memory means based upon an output from said discriminating means, wherein said discriminating means includes a subtracter circuit which subtracts said plurality of timer time signals read out from said memory means from a clock signal to produce a difference time, a difference time memory capable of memorizing a plurality of difference times, a discriminator circuit for discriminating whether the difference time is positive or negative, and a data register which provides the smallest absolute value between the positive and negative difference times.

4,318,182

DEADLOCK DETECTION AND PREVENTION MECHANISM FOR A COMPUTER SYSTEM

Charles W. Bachman, Lexington, and Jacques Bouvard, Wellesley, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Apr. 19, 1974, Ser. No. 462,552
Int. Cl.³ G06F *15/16*
U.S. Cl. 364—200 **12 Claims**



1. In combination with a multiprogram computer system having a plurality of resources and also having a plurality of processes, each process capable of assuming a running, ready, wait or suspended state, and having an extended semaphore mechanism associated with an event whose occurrence is the detection in any of a first plurality of processes of a condition which is significant to any of a second plurality of processes, a deadlock detection system for detecting the situation wherein any first of said processes is waiting for any one or a plurality of said resources which can never become available to said any first of said processes, said deadlock detection system comprising:

(a) first means for establishing on behalf of said any of said second processes an interest in at least one event occurrence in any of said first plurality of processes;

(b) second means, coupled to said first means, for specifying the condition which constitutes an event occurrence of interest to any of said second processes;

(c) third means, coupled to said first and second means, for monitoring on behalf of said any of said second plurality of processes for said event occurrence, in said any of said first plurality of processes; and

(d) fourth means coupled to said first and second means for notifying said first means that said one event occurrence in said any of said first plurality of processes cannot occur.

4,318,183

MULTIPLE CHANNEL DIGITAL MEMORY SYSTEM

Roy E. Byington, Sudbury, and William M. Pease, Weston, both of Mass., assignors to Raytheon Company, Lexington, Mass.

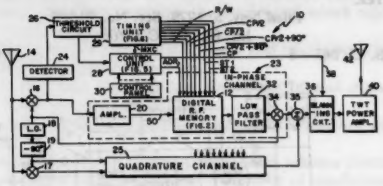
Filed Dec. 22, 1978, Ser. No. 972,594
Int. Cl.³ G06F *1/00*; G06J *1/00*
U.S. Cl. 364—900 **10 Claims**

1. A system for digitally storing samples of the amplitude of an analog signal, such samples being taken at a constant sampling frequency, f, comprising:

(a) a plurality of, n, digital storage means, each one being fed, in parallel, by the analog signal and each one being adapted to store a train of samples of the amplitude of the analog signal fed thereto in response to a train of sampling

pulses fed to such one of the plurality of digital storage means;

(b) means for producing a plurality of trains of the sampling pulses, each one of such trains of the sampling pulses having a pulse repetition frequency f/n, with the sampling



pulses in the trains thereof being displaced in time, one from another, an amount 1/(nf); and,

(c) means for feeding each one of the plurality of the produced trains of the sampling pulses to a corresponding one of the plurality of digital storage means.

4,318,184

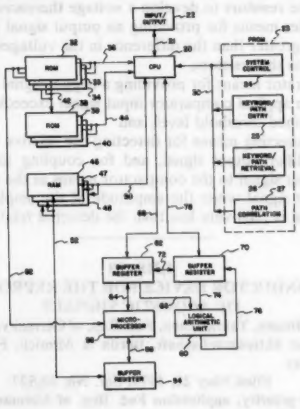
INFORMATION STORAGE AND RETRIEVAL SYSTEM AND METHOD

Ronald P. Millett, 3985 N. 850 East, Provo, Utah 84601, and Dell K. Allen, 195 S. Inglewood Dr., Orem, Utah 84057

Filed Sep. 5, 1978, Ser. No. 939,630

Int. Cl.³ G06F *7/06, 15/40, 3/14*

U.S. Cl. 364—900 **7 Claims**



5. In a computer-assisted manufacturing plant having a CPU with a main memory, an input/output device electronically coupled to said CPU, and a storage memory electronically coupled to said CPU, a method of planning and standardizing each sequence of manufacturing operations to be performed in manufacturing a plurality of different parts, the method comprising the steps of:

(1) logically classifying and arranging a plurality of part shape attributes in the form of a first hierarchal information tree having a plurality of mutually exclusive paths leading to the classified part shape attributes that are located at various levels in the hierarchy of said first tree;

(2) logically classifying and arranging a plurality of materials attributes in the form of a second hierarchal information tree having a plurality of mutually exclusive paths leading to the classified materials attributes that are located at various levels in the hierarchy of said second tree;

(3) logically classifying and arranging a plurality of manufacturing steps in the form of a third hierarchal information tree having a plurality of mutually exclusive paths leading to the classified manufacturing steps that are located at various levels in the hierarchy of said third tree;

(4) storing said first, second and third trees in said storage memory;

(5) entering one or more of said part shape attributes and said materials attributes at said input/output device, each said entered attribute defining a keyword;

(6) recalling from said storage memory and generating at said input/output device a display of the mutually exclusive paths for one or more levels in the hierarchal structure of said third tree;

(7) selecting from the displayed paths of said third tree a concurrent set of paths corresponding to one of said entered keywords, said concurrent set of paths identifying a series of manufacturing steps for producing the attribute defined by said keyword;

(8) encoding in a single bit string said concurrent set of paths selected in step (7), and storing said encoded set of paths in said main CPU memory in an address identified by said keyword;

(9) repeating steps (6) through (8) for each said keyword;

(10) obtaining a drawing of a part to be manufactured;

(11) recalling from said storage memory and generating at said input/output device a display of one or more levels in the hierarchy of each said first and second trees;

(12) selecting from the levels displayed in step (11) a list of one or more part shape and materials attributes that are descriptive of said part to be manufactured;

(13) identifying from said main CPU memory all keywords matching the attributes of said list;

(14) retrieving from said main CPU memory the encoded set of paths for each matching keyword;

(15) logically intersecting the encoded sets of paths retrieved in step (14), so that one encoded set of paths will result from said intersection;

(16) decoding the concurrent set of paths resulting from the intersection of step (15);

(17) generating at said input/output device a display of the manufacturing steps identified in said third tree by the concurrent set of paths decoded in step (16);

(18) obtaining the raw materials corresponding to the part to be manufactured; and

(19) manufacturing said part by performing the manufacturing steps displayed in step (17).

4,318,185

PROGRAMMABLE SWITCHING DEVICE

Helmut Fiedler, Eichbaumstrasse 33, 8011 Siegertsbrunn, Fed. Rep. of Germany

Filed Oct. 17, 1979, Ser. No. 85,783

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1978, 2846686

Int. Cl.³ G06F *15/46;* **H04Q** *9/00*

U.S. Cl. 364—900 **7 Claims**

1. A programmable switching device for controlling a time related sequence of functions in devices, each function having individual steps associated therewith, comprising:

a plurality of inputs;

input signals at the inputs for initiating a carrying out of the functions;

pulse generator means for producing timing signals;

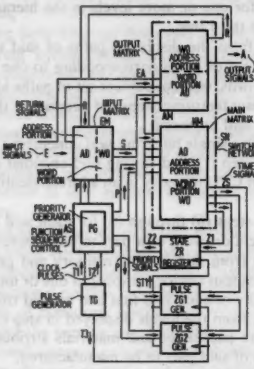
a switching network means having at least one programmable matrix for generating output signals associated with the individual steps of the functions to be carried out on the devices at times which are determined by the timing signals of said pulse generator means and for producing operating state signals corresponding to the operating states necessary for logical association of the input signals to the output signals;

a state register means connected to the pulse generator means and the switching network means for storing said operating states;

a progammable input matrix means connected to said plurality of inputs;

a functional sequence controlling means having a priority generator for producing priority signals associated with different priority levels and for providing them to the input matrix means and to the switching network means;

the input matrix means producing control signals which are fed to the switching network means in dependence upon



said input signals and in dependence upon said priority signals associated with different priority levels;

a portion of the output signals being fed back as return signals to the input matrix means; and

the input matrix means being designed as a switch through matrix for feeding at least a portion of the input signals or said return signals through to the switching network means in dependence upon the priority signals.

4,318,186

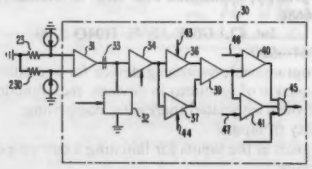
MAGNETIC BUBBLE MEMORY WITH DETECTOR

Woodson D. Wynn, Basking Ridge, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 23, 1980, Ser. No. 162,171

Int. Cl.³ G11C *19/08*

U.S. Cl. 365—8 **9 Claims**



1. A magnetic bubble memory including a layer in which magnetic bubbles can be moved along a path in response to a periodic drive field and a first detector coupled to said path for providing first and second output signals responsive to the presence and absence of a magnetic bubble at said first detector during a detection interval, said memory being characterized by a detection circuit responsive to the outputs from said detector during consecutive ones of said detection intervals for providing first and second amplified signals representative of different and like output signals respectively during consecutive ones of said detection intervals.

4,318,187

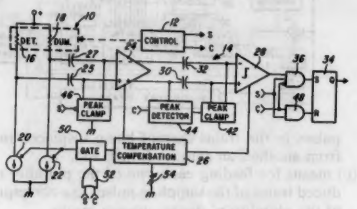
PHASE TOLERANT MAGNETIC BUBBLE MEMORY SENSE AMPLIFIER

Jerold A. Seitchik; Thomas A. Closson, both of Dallas; David B. Oxford, Garland, and Stephen R. Schenck, McKinney, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 5, 1979, Ser. No. 90,959

Int. Cl.³ G11C *19/08*

U.S. Cl. 365—8 **5 Claims**



1. In combination with a magnetic bubble memory system comprising;

a magnetic bubble memory device having magnetic bubbles stored therein, a detector resistor which changes resistance in response to the movement of a magnetic bubble therebeneath, and a dummy resistor; and

control means for moving the magnetic bubbles stored in the magnetic memory device beneath the detector resistor;

an improved sense amplifier comprising:

current source for providing a flow of current through each of the resistors to develop a voltage thereacross;

amplifier means for providing an output signal proportionally greater than the difference in the voltages developed across the resistors;

comparator means for providing a trigger signal in response to an applied comparator input signal exceeding a predetermined threshold level; and

peak detecting means for detecting the relative peak of the amplifier output signal, and for coupling the amplifier output signal to the comparator means as the comparator input signal when the amplitude of the amplifier output signal is relatively less than the detected relative peak.

4,318,188

SEMICONDUCTOR DEVICE FOR THE REPRODUCTION OF ACOUSTIC SIGNALS

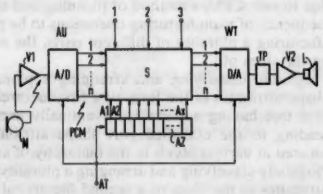
Kurt Hoffmann, Taufkirchen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 21, 1979, Ser. No. 40,527

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1978, 2826870

Int. Cl.³ G11C *13/00*

U.S. Cl. 365—45 **10 Claims**



1. Apparatus for reproducing acoustic signals, comprising:

a microphone for transducing an acoustic signal into an analog electrical signal;

analog/digital converter means connected to said microphone and operable to convert the analog signals into a

digital signal of discrete electrical pulses representing the information content of the acoustic signal;

semiconductor read/write memory means connectible to said analog/digital converter means for storing the information manifest in the digital signal;

digital/analog converter means connected to said read/-write memory means and operable to convert the stored digital signal into an analog electrical signal which represents the original acoustic signal;

an input amplifier interposed between said microphone and said analog/digital converter;

a low pass filter connected to the output of said digital-/analog converter means; and

an output amplifier connected to the output of said low pass filter,

wherein said memory means comprises an address counter including a timing pulse input, a plurality of parallel-connected non-volatile read/write memories each including a timing pulse input, each connected to said address counter, and each including a selection signal input, and means, including a timing pulse input, connected to said selection signal input and operable to generate selection signals for controlling the operation of said memories,

said analog/digital converter means including a timing pulse input,

said digital/analog converter means including a timing pulse input, and

each of said timing pulse inputs of said address counter, said read/write memories, said analog/digital converter means, and said digital/analog converter means, connected to receive the same timing pulses.

DESIGN PATENTS

GRANTED MAR. 2, 1982

ERRATA

For CLASS	See PATENT NO.
D34–024	263,210
D34–029	263,211
D32–021	263,234
D32–022	263,235
D32–032	263,236
D12–101	263,238

DESIGN PATENTS

GRANTED MAR. 1, 1966

ERRATA

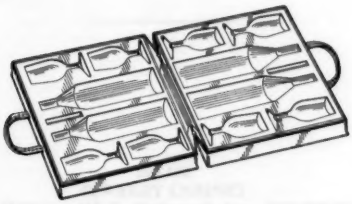
Cl.	Sec.
CLASS	PATENT NO.
D24-024	202,120
D24-029	202,121
D32-021	202,224
D32-022	202,225
D42-022	202,226
D12-101	202,228

DESIGNS

MARCH 2, 1982

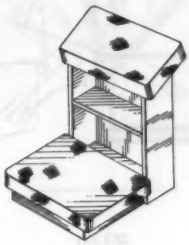
263,175
BRAIDED LACE KEYHOLDER
Louis H. Press, 3635 Johnson Ave., Riverdale, N.Y. 10463
Filed Aug. 2, 1979, Ser. No. 63,353
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—65

263,176
CARRYING CASE FOR WINE BOTTLES AND GLASSES
Thomas J. Harrington, 16601 Gothard St., Ste. E, Huntington Beach, Calif. 92647
Filed Feb. 19, 1980, Ser. No. 122,020
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—71



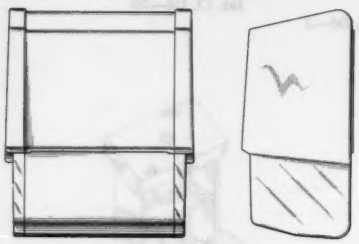
263,177
SUITCASE
Richard B. Gibbs, 11548 Thurston Cir., Los Angeles, Calif. 90049
Filed Mar. 10, 1980, Ser. No. 128,645
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—71

263,178
COMBINED PRAYER BENCH AND CABINET
James E. Van Linden, and Betty J. Van Linden, both of Clio, Mich., assignors to Daily Prayer Company, Clio, Mich.
Filed Mar. 20, 1980, Ser. No. 132,065
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—2

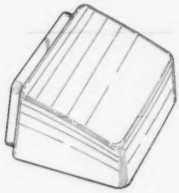


263,179
STAND FOR VERTICALLY SUPPORTING A ROLL OF PAPER
Donald W. Lash, deceased, late of Kentwood, Mich. (by Gertrude Lash), assignor to Gertrude Lash, executrix, Grand Rapids, Mich.
Filed May 30, 1978, Ser. No. 910,746
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—85

263,180
TOWEL DISPENSER
Walter B. Herbst, Evanston, Ill., assignor to Steiner Corporation, Chicago, Ill.
Filed Apr. 13, 1979, Ser. No. 29,623
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—96



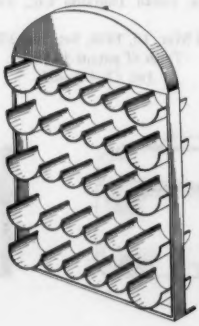
263,181
TOILET PAPER ROLL HOLDER
Bruce R. Thompson, Tranmere, Australia, assignor to UPL Group Limited, Brisbane, Australia
Filed Feb. 13, 1980, Ser. No. 121,214
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—97



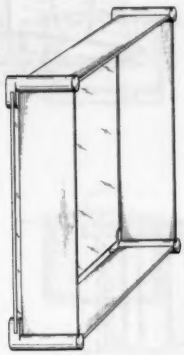
263,182
TOWEL RING
Bruce R. Thompson, Tranmere, Australia, assignor to UPL Group Limited, Brisbane, Australia
Filed Feb. 13, 1980, Ser. No. 121,245
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—99

263,183
HANGING SHELF
Richard F. Laurenzi, 278 Sterling Pl., Brooklyn, N.Y. 11238
Continuation-in-part of Ser. No. 871,023, Jan. 20, 1978, Pat. No. D. 255,299. This application Dec. 21, 1979, Ser. No. 105,962
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—113

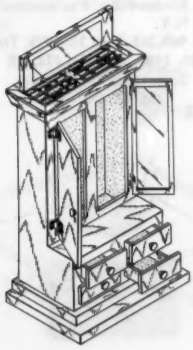
263,184
THREAD SPOOL WALL RACK
John J. Meehan, III, 103 Park Ave., Wyckoff, N.J. 07481
Filed Aug. 3, 1978, Ser. No. 930,822
Term of patent 14 years
Int. Cl. D06—*04*; D03—*99*
U.S. Cl. D6—130



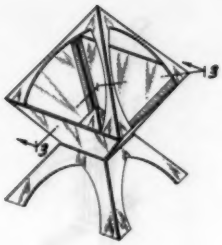
263,185
COMBINED MIRROR AND SHELF UNIT
Winfried Scholl, Düsseldorf, Fed. Rep. of Germany, assignor to HEWI, Heinrich Wilke GmbH, Arolsen, Fed. Rep. of Germany
Filed Aug. 7, 1979, Ser. No. 64,563
Claims priority, application Fed. Rep. of Germany, Feb. 8, 1979, MR91
Term of patent 14 years
Int. Cl. D6—*04, 07*
U.S. Cl. D6—134



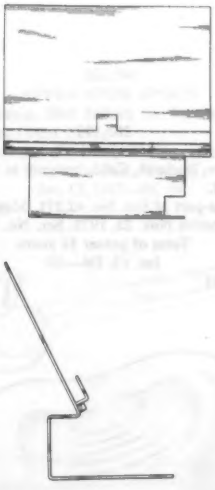
263,186
JEWELRY CABINET
Annette Williams, 415 E. Wadsworth Ave., Philadelphia, Pa. 19119
Filed Aug. 27, 1979, Ser. No. 69,754
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—163



263,187
PLANTER
Paul D. Peterson, 3310 Azahar Pl., Rancho La Costa, Calif. 92008
Filed Sep. 17, 1979, Ser. No. 76,474
Term of patent 14 years
Int. Cl. D6—*06;* D11—*02*
U.S. Cl. D6—183



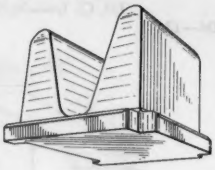
263,188
COMBINED MAGAZINE STAND AND CABLE TV CHANNEL SELECTOR HOLDER
Harry Cohen, Union, N.J., assignor to Barry Cohen, Houston, Tex.
Filed Nov. 15, 1979, Ser. No. 94,505
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—184

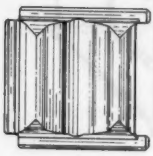


263,189
SUPPORT LEG FOR FURNITURE
Matthew E. Beals, St. Louis, Mo., assignor to Falcon Products Incorporated, St. Louis, Mo.
Filed Jan. 14, 1980, Ser. No. 111,911
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—195

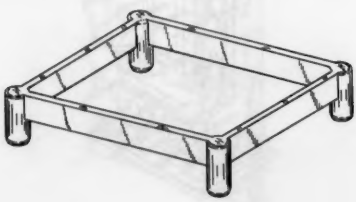
263,190
HEAD REST
Nicholas G. Herr, Burbank, Calif., assignor to Xenika, Inc., Los Angeles, Calif.
Continuation-in-part of Ser. No. 42,271, May 24, 1979. This application Nov. 23, 1979, Ser. No. 97,063
Term of patent 14 years
Int. Cl. D6—*09*
U.S. Cl. D6—201

263,191
TACO HOLDER
Joseph W. Moore, 3235 Morrell Ave., Kansas City, Mo. 64123
Filed Jun. 16, 1980, Ser. No. 160,018
Term of patent 14 years
Int. Cl. D07—*99*
U.S. Cl. D7—37

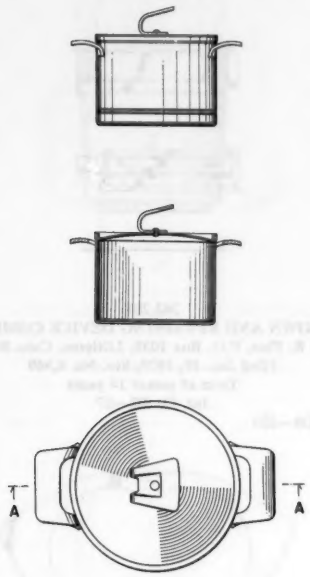




263,192
SUPPORT STAND FOR DISHES OR THE LIKE
Kenneth R. LeVan, Kintnersville, Pa., assignor to Corning Glass Works, Corning, N.Y.
Division of Ser. No. 969,245, Dec. 13, 1978. This application Jul. 31, 1980, Ser. No. 174,218
Term of patent 14 years
Int. Cl. D07—*06*
U.S. Cl. D7—39



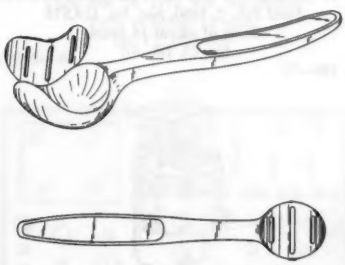
263,193
COOKING POT
Toshio Sano, Tsubame, Japan, assignor to Kabushiki Kaisha Sano Seisakusho, Japan
Filed Dec. 4, 1978, Ser. No. 966,461
Claims priority, application Japan, Jun. 3, 1978, 53-023092
Term of patent 14 years
Int. Cl. D07—*02*
U.S. Cl. D7—97



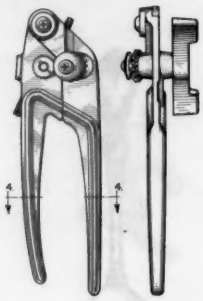
263,194
BARBECUE GRILL
Larry A. Schwartz, 67 Hess Ave., Warwick, R.I. 02889
Filed Dec. 4, 1978, Ser. No. 966,774
Term of patent 14 years
Int. Cl. D07—*02*
U.S. Cl. D7—109

263,195
SPOON OR SIMILAR ARTICLE
Ellen B. Manderfield, Syracuse, N.Y., assignor to General Mills, Inc., Minneapolis, Minn.
Filed Jan. 15, 1980, Ser. No. 112,376
Term of patent 14 years
Int. Cl. D07—*03*
U.S. Cl. D7—137

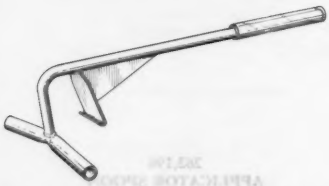
263,196
APPLICATOR SPOON
Sydney L. Dickinson, 5869 Selkirk St., Vancouver, British Columbia, Canada (V6M 2Y5)
Filed Jul. 28, 1980, Ser. No. 172,498
Term of patent 14 years
Int. Cl. D07—*03, 04*
U.S. Cl. D7—140



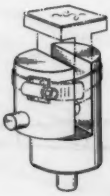
263,197
CAN OPENER
Roger L. Kelly, Palatine, Ill., assignor to American Home Products Corporation, New York, N.Y.
Filed Sep. 7, 1979, Ser. No. 73,265
Term of patent 14 years
Int. Cl. D07—*99*
U.S. Cl. D8—39



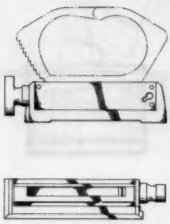
263,198
BUCKET LID OPENING TOOL
Robert H. Boyd, 11216 Ashwood, Dallas, Tex. 75253
Filed May 12, 1980, Ser. No. 148,071
Term of patent 14 years
Int. Cl. D07—*99*
U.S. Cl. D8—40



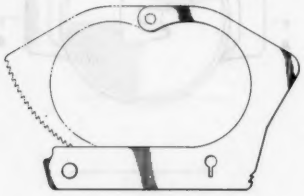
263,199
CLAMP AND JIG COMBINATION FOR ENGRAVING
Richard H. Lockie, P.O. Box 1887, Hawthorne, Nev. 89415
Filed Feb. 7, 1980, Ser. No. 119,573
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—71



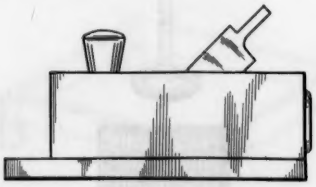
263,200
BASE FOR A HOLDDOWN AND RETAINING DEVICE COMPONENT
Raymond R. Finn, P.O. Box 1035, Littleton, Colo. 80120
Filed Jan. 19, 1979, Ser. No. 4,948
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—333



263,201
HOLDDOWN AND RETAINING DEVICE COMPONENT
Raymond R. Finn, P.O. Box 1035, Littleton, Colo. 80120
Filed Jan. 19, 1979, Ser. No. 4,949
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—333

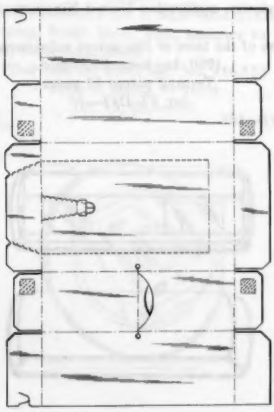


263,202
BOX
Hugo Hermann, Weissenhorner Strasse 15, D-7917 Vöhringen 2, Fed. Rep. of Germany
Filed Nov. 22, 1978, Ser. No. 962,942
Claims priority, application Fed. Rep. of Germany, May 23, 1978, 7815501[U]
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—307

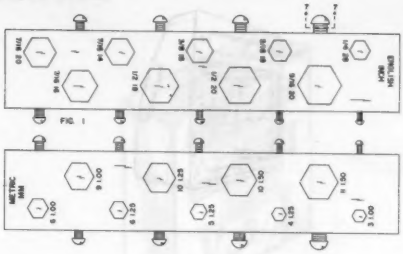


263,203
PACKAGING CONTAINER OR THE LIKE
John J. Haag, Sr., Evansville, Ind., assignor to Ball Corporation, Muncie, Ind.
Filed Apr. 11, 1979, Ser. No. 29,366
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—370

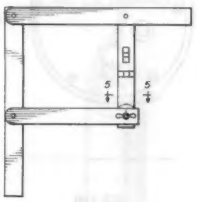
263,204
ARTICLE CARRIER BLANK
Daniel P. Dutcher, Woodbury, Minn., assignor to Champion International Corporation, Stamford, Conn.
Filed Oct. 26, 1979, Ser. No. 88,391
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—433



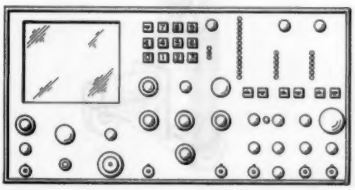
263,205
BOLT AND NUT SIZER
Gary W. Kennedy, 1112 Fourth Ave., NW., Arab, Ala. 35016
Filed Feb. 12, 1980, Ser. No. 120,908
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—64



263,206
ANGLE FINDER
Carl N. Rockholt, 2428 Cherokee Rd., and Everett L. Spurgin, 1554 Sierra La., both of Stockton, Calif. 95205
Filed Oct. 31, 1979, Ser. No. 90,032
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—65

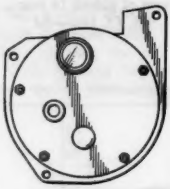


263,207
FRONT PANEL FOR A COMMUNICATION SYSTEM ANALYZER OR SIMILAR ARTICLE
Robert H. Bickley, Scottsdale; Allen L. Duddles, Tempe; Robert J. Skalka, Mesa, all of Ariz.; John R. Rezek, Barrington, and Kenneth W. Larson, Elmhurst, both of Ill., assignors to Motorola Inc., Schaumburg, Ill.
Filed Jun. 18, 1979, Ser. No. 50,008
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—80

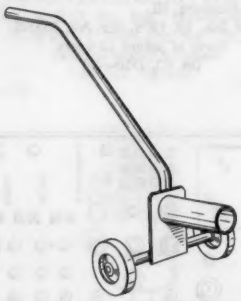


263,208
ELECTRICAL TEST SET HOUSING MEMBER
Clifford D. Read, Almonte, Canada, assignor to Northern Telecom Limited, Montreal, Canada
Filed Nov. 5, 1979, Ser. No. 91,593
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—80

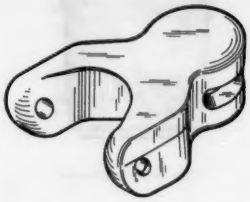
263,209
CHART DRIVE CLOCK CASE
William T. Capps, 5907 Schuler St., Houston, Tex. 77007
Filed Jan. 26, 1979, Ser. No. 6,845
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—103



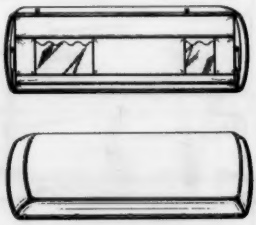
263,210
DOLLY FOR TRANSPORTING COILED GOODS
Marinus J. M. Langen, Rexdale, and Edgars H. Strauss, Toronto, both of Canada, assignors to H. J. Langen & Sons Limited, Rexdale, Canada
Filed Jul. 9, 1979, Ser. No. 56,020
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D34—24



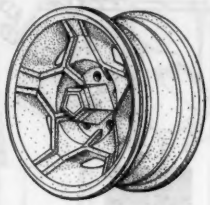
263,211
CHAIN LINK FOR A CONVEYOR CHAIN
Arthur J. Brooks, Milwaukee; William G. Hodlewsky, Greendale, and Roger H. Schroeder, Hartland, all of Wis., assignors to Rexnord Inc., Milwaukee, Wis.
Filed Jul. 26, 1979, Ser. No. 60,712
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D34—29



263,212
COMBINED VEHICLE ELEVATING ROOF AND ENCLOSURE UNIT
David Lee, Northchurch House, Northchurch, Hertfordshire, England
Filed Jul. 11, 1978, Ser. No. 923,631
Claims priority, application United Kingdom, Jan. 19, 1978, 983020/78
The portion of the term of this patent subsequent to Sep. 14, 1990, has been disclaimed.
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—156



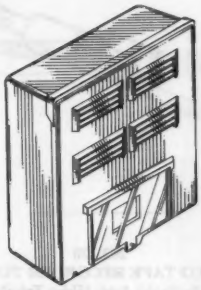
263,213
WHEEL
Russell O. Blanchard, Marshall; Joseph Guzek, Lansing, and Donald A. Matt, Bath, all of Mich., assignors to Motor Wheel Corporation, Lansing, Mich.
Filed Jan. 18, 1979, Ser. No. 4,348
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—209



263,214
END FRAME FOR A SERVOMOTOR
John J. Horsting, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.
Filed Jan. 29, 1980, Ser. No. 116,522
Term of patent 14 years
Int. Cl. D13—*99*
U.S. Cl. D13—1

263,215
END FRAME FOR A SERVOMOTOR
John J. Horsting, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.
Filed Jan. 29, 1980, Ser. No. 116,523
Term of patent 14 years
Int. Cl. D13—*99*
U.S. Cl. D13—1

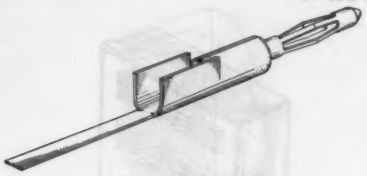
263,216
PROTECTIVE VENTILATED PANEL FOR ELECTRICAL AND ELECTRONIC COMPONENTS
Frank Maher, Phoenix, Ariz., assignor to Cyborex Laboratories, Inc., Phoenix, Ariz.
Filed Dec. 3, 1979, Ser. No. 99,614
Term of patent 14 years
Int. Cl. D13—*99*
U.S. Cl. D13—4



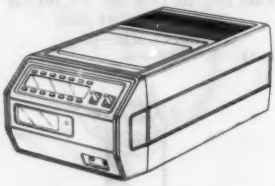
263,217
HOUSING FOR AN ARC SUPPRESSOR
William E. Kauffman, Greenfield, Tenn., assignor to Whitehall Corporation, Dallas, Tex.
Filed Dec. 10, 1979, Ser. No. 101,725
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—11

263,218
HOUSING FOR AN ARC SUPPRESSOR
William E. Kauffman, Greenfield, Tenn., assignor to Whitehall Corporation, Dallas, Tex.
Filed Dec. 10, 1979, Ser. No. 101,726
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—11

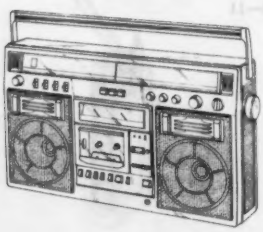
263,219
ELECTRICAL CONTACT PIN
Herta Viets, Banning, Calif., assignor to Precision Stampings, Inc., Beaumont, Calif.
Filed Feb. 4, 1980, Ser. No. 118,399
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—24



263,220
VIDEO TAPE RECORDER TUNER
Koya Kurokawa; Noriyuki Arai; Hideo Takahashi, and Taisuke Saeki, all of Saijyo, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Mar. 7, 1979, Ser. No. 18,213
Claims priority, application Japan, Sep. 8, 1978, 53/38537
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—2

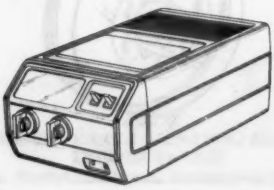


263,221
COMBINED CASSETTE RECORDER AND RADIO RECEIVER
Yoichi Hisano, Hirakata; Takao Okada, Kyoto; Iwao Nakajima, Ikoma, and Benito Mishiro, Sakai, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jun. 9, 1980, Ser. No. 157,732
Claims priority, application Japan, Dec. 20, 1979, 54-53703
Term of patent 14 years
Int. Cl. D14—*01, 03*
U.S. Cl. D14—5



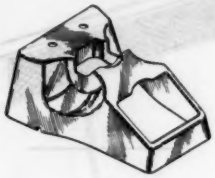
263,222
DISK CARTRIDGE
Edward K. Driscoll, Paris, France, assignor to Honeywell Information Systems Inc., Waltham, Mass.
Filed Aug. 24, 1979, Ser. No. 69,941
Term of patent 14 years
Int. Cl. D14—*01, 99*
U.S. Cl. D14—11

263,223
VIDEO TAPE RECORDER CONTROLLER
Koya Kurokawa; Noriyuki Arai; Hideo Takahashi, and Taisuke Saeki, all of Saijyo, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Mar. 7, 1979, Ser. No. 18,395
Claims priority, application Japan, Dec. 7, 1978, 53-38173
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—02

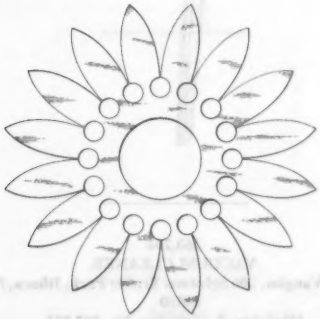


263,224
SIDE PANEL FOR READILY DISASSEMBLED INSTRUMENT HOUSING
Peter A. Peroni, Pottstown, Pa., assignor to LaFrance Corporation, Philadelphia, Pa.
Filed May 10, 1979, Ser. No. 37,675
Term of patent 14 years
Int. Cl. D14—*99*
U.S. Cl. D14—114

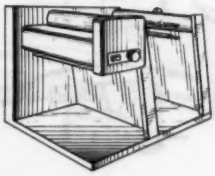
263,225
DECORATIVE SHELL COVER FOR TELEPHONE
John S. Jordan, Roswell, Ga., assignor to Jordan Concepts, Inc., Roswell, Ga.
Filed Feb. 25, 1980, Ser. No. 124,244
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—60



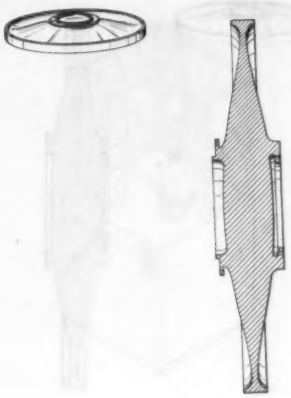
263,226
ANTENNA
Stig L. Rehnmark, Skaneateles, N.Y., assignor to Anaren Microwave, Incorporated, Syracuse, N.Y.
Filed Nov. 22, 1978, Ser. No. 963,516
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—87



263,227
DELEAVER OR SIMILAR ARTICLE
Andrew L. Alger, Wilmette, Ill., assignor to UARCO Incorporated, Barrington, Ill.
Filed Jun. 12, 1980, Ser. No. 158,934
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—110

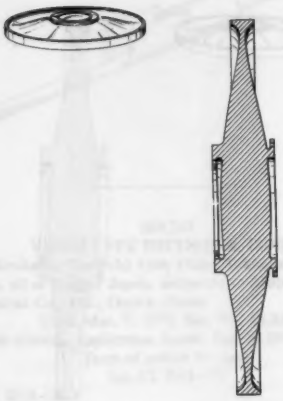


263,228
FLYWHEEL
Frederick P. Nitz; Paul J. Passi, both of Canoga Park; Donald R. Hodson, and Donald E. Davis, both of Thousand Oaks, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.
Filed Apr. 2, 1979, Ser. No. 26,399
Term of patent 14 years
Int. Cl. D15—*01, 99*
U.S. Cl. D15—5



263,229
FLYWHEEL
Frederick P. Nitz; Paul J. Passi, both of Canoga Park; Donald R. Hodson, and Donald E. Davis, both of Thousand Oaks, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.
Filed Apr. 2, 1979, Ser. No. 26,400
Term of patent 14 years
Int. Cl. D15—*01, 99*
U.S. Cl. D15—5

263,230
FLYWHEEL
Frederick P. Nitz; Paul J. Passi, both of Canoga Park; Donald R. Hodson, and Donald E. Davis, both of Thousand Oaks, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.
Filed Apr. 2, 1979, Ser. No. 26,626
Term of patent 14 years
Int. Cl. D15—*01, 99*
U.S. Cl. D15—5

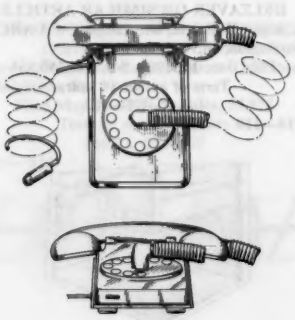


263,231
FLYWHEEL
Frederick P. Nitz; Paul J. Passi, both of Canoga Park; Donald R. Hodson, and Donald E. Davis, both of Thousand Oaks, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.
Filed Apr. 2, 1979, Ser. No. 26,628
Term of patent 14 years
Int. Cl. D15—*01, 99*
U.S. Cl. D15—5

263,232
OIL COOLER
Ramesh Dolwani, 835 E. Walnut St., Carson, Calif. 90746
Filed Oct. 15, 1979, Ser. No. 84,657
Term of patent 14 years
Int. Cl. D15—*01*
U.S. Cl. D15—5

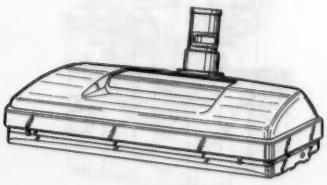
263,233
CULTIVATOR TINE
Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland
Filed Mar. 5, 1979, Ser. No. 17,593
Claims priority, application Benelux Designs Convent, Sep. 8, 1978, 53018.00
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—29

263,234
VACUUM CLEANER
Clarence Vaughn, 106 Schwans Trailer Park, Ithaca, N.Y. 14850
Filed Jan. 7, 1980, Ser. No. 109,961
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D32—21

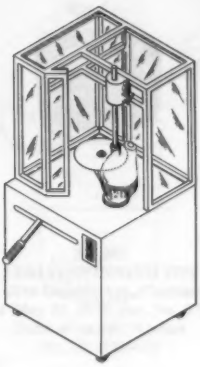


263,235
VACUUM CLEANER
Tsugio Akita, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jan. 2, 1979, Ser. No. 602
Claims priority, application Japan, Jun. 30, 1978, 53-27873
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D32—22

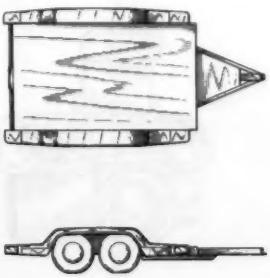
263,236
VACUUM CLEANER NOZZLE
Yoshiaki Ueda, Toyonaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Dec. 12, 1978, Ser. No. 968,668
Claims priority, application Japan, Jun. 14, 1978, 53-25010
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D32—32



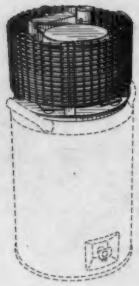
263,237
SPIRAL MEAT SLICER
Robert E. Anderson, 2749 S. Cook, Denver, Colo. 80210, and Vincent A. Fazio, 6192 W. Alder Ave., Littleton, Colo. 80123
Filed Dec. 13, 1979, Ser. No. 103,166
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D15—97



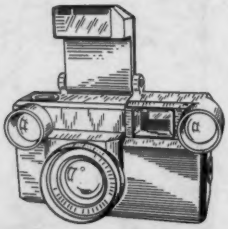
263,238
FLAT BED EQUIPMENT TRAILER
Edward J. Lazzeroni, Racine, Wis., assignor to Miller Tilt-Top Trailer, Inc., Milwaukee, Wis.
Filed Feb. 29, 1980, Ser. No. 126,002
Term of patent 14 years
Int. Cl. D12—*10*
U.S. Cl. D12—101



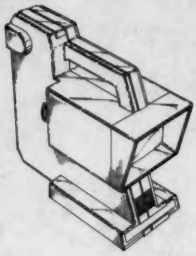
263,239
THERMOSTATICALLY CONTROLLED PORTABLE WATER COOLER
Earl J. Shurtz, 3620 E. English, 206B, Wichita, Kans. 67218
Filed Feb. 14, 1980, Ser. No. 121,412
Term of patent 14 years
Int. Cl. D15—*07*
U.S. Cl. D15—118



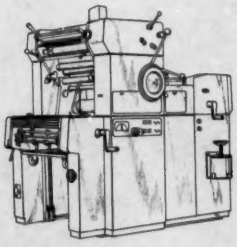
263,240
PHOTOGRAPHIC FLASH CAMERA
Herbert Schultes, Fuerstenfeldbruck, and Hermann R. Segers, Munich, both of Fed. Rep. of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany
Filed May 14, 1979, Ser. No. 38,721
Claims priority, application Fed. Rep. of Germany, Nov. 29, 1978, 5MR550-G159
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—6



263,241
FILM VIEWER
Dennis H. Ting, Aberdeen, Hong Kong, assignor to Qualidux Industrial Company Limited, Aberdeen, Hong Kong
Filed Feb. 26, 1980, Ser. No. 124,759
Claims priority, application United Kingdom, Jan. 10, 1980, 993114
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D16—17

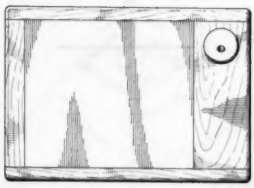


263,242
PRINTING MACHINE
Etsuo Hiraishi, Hiroshima, and Masakazu Sakamoto, Fukuyama, both of Japan, assignors to Ryobi, Ltd., Hiroshima, Japan
Filed Feb. 27, 1980, Ser. No. 125,173
Claims priority, application Japan, Aug. 30, 1979, 54-36476
Term of patent 14 years
Int. Cl. D18—*02*
U.S. Cl. D18—13

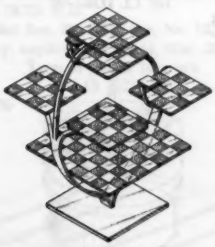


263,243
REMINDER CLIP OR THE LIKE
Joan K. Creamer, East Greenwich, R.I., assignor to Dart Industries Inc., Northbrook, Ill.
Filed Apr. 21, 1980, Ser. No. 141,876
Term of patent 14 years
Int. Cl. D19—*99*
U.S. Cl. D19—34

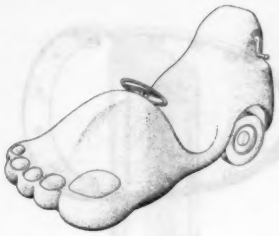
263,244
BASE FOR A DESK SET
Clayton A. Laughlin, Minneapolis, Minn., assignor to Ketcham & McDougall, Inc., Roseland, N.J.
Filed Jul. 25, 1979, Ser. No. 60,522
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—77



263,245
MULTIPLE LEVEL CHESS BOARD
Robert D. Bonser, 3260 Colby Ave., Los Angeles, Calif. 90066
Filed Jan. 14, 1980, Ser. No. 111,882
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—23



263,246
SIMULATIVE TOY TRUCK
James K. Pollitt, 14021 Congress Dr., Rockville, Md. 20853
Filed Feb. 22, 1980, Ser. No. 123,760
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—73



263,247
AERIAL SPINNING TOY
Robert D. Harris, 2014 Bennett Ave., Chattanooga, Tenn. 37404
Filed May 10, 1979, Ser. No. 37,826
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—82

263,248
BALL PLAYING STICK
William H. Brine, Jr., Gypsy La., Weston, Mass. 02193
Filed Feb. 22, 1980, Ser. No. 123,922
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—210

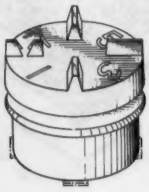
263,249
LACROSSE STICK HEAD
Robert J. Rule, Manhasset, N.Y., assignor to W. H. Brine Company, Milford, Mass.
Filed Apr. 28, 1980, Ser. No. 144,371
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—210

263,250
WATER-SKI HANDLE
Anthony P. McAuliffe, 973 E. 6600 South, No. 19, Ogden, Utah 84403
Filed Nov. 5, 1979, Ser. No. 91,109
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—230

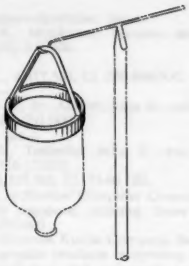
263,251
FOIL HANDLE
Kwong-Yu R. Lee, 9212 W. Sally La., Schiller Park, Ill. 60176
Filed Apr. 30, 1980, Ser. No. 133,544
Term of patent 14 years
Int. Cl. D22—*02*
U.S. Cl. D22—1

263,252
DENTAL HANDPIECE
Masakazu Kakimoto, Aichi, Japan, assignor to Ushio Air Tool Co., Ltd., Aichi, Japan
Filed Mar. 13, 1979, Ser. No. 20,034
Claims priority, application Japan, Sep. 13, 1978, 53-39201
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—12

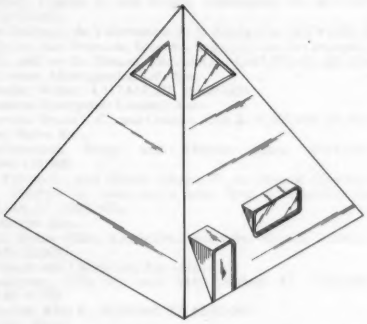
263,253
COMBINED HEARING AID VOLUME CONTROL KNOB AND ADAPTER RING
Clarence W. Reynolds, 3031 Flag Ave. North, Minneapolis, Minn. 55427
Filed Sep. 7, 1979, Ser. No. 73,318
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D24—35



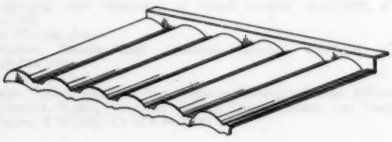
263,254
INTRAVENOUS SUPPLY CONTAINER SUPPORT OR THE LIKE
Robert W. Ogle, Newport Beach, Calif., assignor to IMS Limited, So. El Monte, Calif.
Filed Aug. 27, 1979, Ser. No. 69,701
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—99



263,255
BUILDING
Miroslav M. Zima, Calle El Recreo, Edf. Centinela pH 2-131 S/Grande, Caracas, Venezuela
Filed Dec. 8, 1978, Ser. No. 967,737
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—26



263,256
ROOFING TILE
Frederick R. Morse, P.O. Box 26, 138 John St., Napanee, Ontario, Canada (K7R 3L4)
Filed Sep. 25, 1979, Ser. No. 78,637
Claims priority, application Canada, Mar. 28, 1979, 28037911
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—96



263,257
FLUORESCENT LANTERN
Ernest F. Thomson, Fairfield, Conn., assignor to Duracell International Inc., Bethel, Conn.
Filed May 3, 1979, Ser. No. 35,589
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D26—42

263,258
FLASH LIGHT
Noel E. Zeller, White Plains, N.Y., assignor to Zelco Industries, Inc., Mount Vernon, N.Y.
Filed Feb. 28, 1980, Ser. No. 120,132
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D26—49

263,259
HOG CARCASS SHAVER
Byron J. Getter, Troy, Ohio, assignor to Wolverine World Wide, Inc., Rockford, Mich.
Filed Jan. 3, 1980, Ser. No. 109,411
Term of patent 14 years
Int. Cl. D30—*99*
U.S. Cl. D30—99

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 2ND DAY OF MARCH, 1982

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A/S Raufoss Ammunisjonsfabrikker: *See—*
Strandli, Kare R.; Middleton, Thomas; and Fjeldstad, Jarle, 4,317,413, Cl. 102-275.900.

AB Volvo: *See—*
Pilhall, Stig T. L., 4,317,583, Cl. 280-804.000.

Abbott, John A.: *See—*
Roberts, Thomas E., Jr.; Abbott, John A.; and Wright, Bruce M., 4,317,731, Cl. 210-741.000.

Abbott Laboratories: *See—*
Martin, Jerry R.; Tadanikr, John S.; and Collum, Paulette, 4,317,904, Cl. 536-17.00R.
Shen, Linus L., 4,317,363, Cl. 73-64.100.

Abbott, Warwick R., to Nixdorf Computer Corporation, The. Switching power supply regulator utilizing linear regulator device. 4,318,039, Cl. 323-273.000.

Abel, Edward P., to Eastman Kodak Company. Barrier layer between reactants in photographic products comprising a mixture of vinylidene chloride terpolymer and polymeric carboxy-ester-lactone. 4,317,892, Cl. 525-194.000.

Abic, Ltd.: *See—*
Simonovitch, Chaim, 4,317,824, Cl. 424-250.000.

Abolins, Visvaldis, to General Electric Company. Clay filled polyphenylene ether compositions. 4,317,761, Cl. 524-141.000.

Acampora, Alfonse, to RCA Corporation. Color TV buried subcarrier system. 4,318,120, Cl. 358-12.000.

Ackermann, Jakob: *See—*
Kramis, Jost; and Ackermann, Jakob, 4,317,660, Cl. 51-295.000.

Adams, James M.: *See—*
Raley, Garland E.; and Adams, James M., 4,317,792, Cl. 264-504.000.

Adamson, Fletcher D., to Russell Corporation. Clearer for drawing rolls of spinning machines and the like. 4,317,261, Cl. 19-265.000.

Advance Automation Assembly Limited: *See—*
Harvey, Charles J.; and Wright, Christopher G., 4,317,385, Cl. 74-436.000.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See—*
Labarre, Jean-Francois; Sournies, Francois; van de Grampel, Johan C.; and van der Huizen, Andriaan A., 4,317,773, Cl. 260-239.0EP.

Agfa-Gevaert Aktiengesellschaft: *See—*
Rauffer, Walter, 4,317,619, Cl. 353-25.000.

Agribusiness Enterprises Limited: *See—*
Derrick, Bruce I. C.; and Geaslin, Jack B., 4,317,308, Cl. 47-1.100.

Ahlgren, Sture: *See—*
Skafvenstedt, Bengt; and Ahlgren, Sture, 4,318,113, Cl. 346-136.000.

Ahuja, Pritam L.; and Borom, Marcus P., to General Electric Company. Method for removing a scale from a superalloy surface. 4,317,685, Cl. 134-2.000.

Aibe, Hiroshi: *See—*
Iino, Kinzo; Ohta, Ken-Ichiro; and Aibe, Hiroshi, 4,318,110, Cl. 346-32.000.

Air Products and Chemicals, Inc.: *See—*
Kaspersma, Jelle H.; and Shay, Robert H., 4,317,687, Cl. 148-16.500.
Prentice, Alan L., 4,317,665, Cl. 62-63.000.

Airco, Inc.: *See—*
Busby, Michael G.; and Hartwig, Diane E., 4,317,879, Cl. 435-14.000.

Aisan Kogyo Kabushiki Kaisha: *See—*
Kato, Yuzo; Tateno, Hidenori; and Kako, Mikitoshi, 4,317,784, Cl. 261-65.000.

Aisin Seiki Kabushiki Kaisha: *See—*
Katagiri, Masayoshi; and Fujii, Takashi, 4,317,508, Cl. 188-218.00A.

Aizenshtein, Anatoly G.: *See—*
Chubarov, Evgeny P.; Kubyshkin, Viktor A.; Mitrofanov, Vladimir E.; Emelyanov, Alexandr N.; Butkovsky, Anatoly G.; Norkin, Kemer B.; Aizenshtein, Anatoly G.; Kolomeitseva, Margarita B.; Suvorov, Arthur M.; and Vazhnov, Sergei A., 4,317,981, Cl. 219-121.0EA.

Akeret, Hans, to Sulzer Brothers Limited. Rack for storing fuel assembly clusters in a water pit. 4,317,702, Cl. 376-272.000.

Akhavi, David S., to American Hospital Supply Corporation. Method of collecting and dispensing a blood sample. 4,317,455, Cl. 128-765.000.

Akimoto, Hiroshi: *See—*
Miyashita, Osamu; and Akimoto, Hiroshi, 4,317,821, Cl. 424-248.540.

Akiyama, Setsuo: *See—*
Honda, Toshio; Tanuma, Itsuo; Ogawa, Masao; Ishikawa, Hikaru; Fukuura, Yukio; Akiyama, Setsuo; Ojima, Shozo; and Naito, Kazuo, 4,317,862, Cl. 428-442.000.

Akzona Incorporated: *See—*
Brownell, Kenneth W.; Bolick, Virgil; Carswell, Joseph; and Hazenfield, Robert C., 4,317,953, Cl. 174-21.00R.
Zengel, Hans; and Bergfeld, Manfred, 4,317,947, Cl. 568-949.000.

Albright, Jane: *See—*
Gerlock, John L.; Braslaw, Jacob; and Albright, Jane, 4,317,939, Cl. 568-121.000.

Alden Research Foundation: *See—*
Partridge, Malcolm F.; Simpkins, Frederick W.; and Farrington, Lawrence A., 4,318,134, Cl. 358-287.000.

Alissandratos, Tacko D. Brush holder. 4,317,605, Cl. 312-206.000.

Allard, Joseph R., to Entwistle Company, The. Combination of strand neutralizer capstan and accumulator and closer. 4,317,328, Cl. 57-59.000.

Allen, Dell K.: *See—*
Millett, Ronald P.; and Allen, Dell K., 4,318,184, Cl. 364-900.000.

Allied Chemical Corporation: *See—*
Marshall, Robert M., 4,317,736, Cl. 252-8.750.

Allis, Robert F.; Kingsley, William; and Allis, Robert F., to Xerox Corporation. Alignment system for scanning arrays. 4,318,135, Cl. 358-294.000.

Allis, Robert F.: *See—*
Allis, Robert F.; Kingsley, William; and Allis, Robert F., 4,318,135, Cl. 358-294.000.

Allison, Kevin W.: *See—*
Provance, Jason D.; and Allison, Kevin W., 4,317,749, Cl. 252-519.000.
Provance, Jason D.; and Allison, Kevin W., 4,317,750, Cl. 252-519.000.

Alt, Robert D.; Richardson, James H.; and Williams, Alverson B., to General Motors Corporation. Battery tray for electric vehicle. 4,317,497, Cl. 180-68.500.

Altenpohl, Paul J.: *See—*
Altenpohl, William F.; and Altenpohl, Paul J., 4,317,258, Cl. 17-24.000.

Altenpohl, William F.; and Altenpohl, Paul J., to W. F. Altenpohl, Inc. Side suspension conveyor system for poultry. 4,317,258, Cl. 17-24.000.

Alter, Seymour S.; and Alter, Steven. Envelope. 4,317,538, Cl. 229-72.000.

Alter, Steven: *See—*
Alter, Seymour S.; and Alter, Steven, 4,317,538, Cl. 229-72.000.

Amada Company, Limited: *See—*
Sato, Tadashi, 4,317,512, Cl. 192-85.0AA.

Amagami, Keizo: *See—*
Mizukawa, Takumi; Amagami, Keizo; Kiuchi, Mitsuyuki; Yoshida, Hirokazu; and Saka, Tatsuo, 4,317,975, Cl. 219-10.49R.

Amaro, David, to Zenith Radio Corporation. Voltage regulator. 4,318,037, Cl. 315-411.000.

Ambrosio, Thomas J.; Buchman, Henry J.; Rogus, Joseph J.; and Sochon, Henry R., to Schering Corporation. Prefilled disposable syringe. 4,317,446, Cl. 128-218.00R.

American Can Company: *See—*
Bowen, Mack D.; and Purdy, Kenneth R., 4,317,703, Cl. 201-1.000.

American Cyanamid Company: *See—*
Sassiver, Martin L.; and Boothe, James H., 4,317,774, Cl. 260-239.100.
Siegman, Edwin J.; and Yelverton, Roy L., 4,317,790, Cl. 264-176.00F.

American Hospital Supply Corporation: *See—*
Akhavi, David S., 4,317,455, Cl. 128-765.000.

American Roller Company: *See—*
Chase, Thomas G.; and Poniatowski, Steven, 4,317,265, Cl. 29-132.000.

Amin, Armando. Adjustable cap kit. 4,317,238, Cl. 2-12.000.

AMP Incorporated: *See—*
Dechelette, Helen, 4,317,608, Cl. 339-99.00R.
Rossler, Frederick W., Jr.; and Feldman, Steven, 4,318,073, Cl. 338-28.000.

Ampex Corporation: *See—*
Ravizza, Raymond F., 4,318,142, Cl. 360-77.000.

Amtel, Inc.: *See—*
Kentosh, James M., 4,317,474, Cl. 141-1.000.

Amtmann, Heribert; and Baeker, Klaus, to Siemens Aktiengesellschaft. X-Ray diagnostic generator comprising switching means for switching-on and -off the high voltage transformer. 4,317,999, Cl. 250-413.000.

Anand, Kranti V.; and Butcher, John B., to National Research Development Corporation. Method of manufacturing field-effect transistors by forming double insulative buried layers by ion-implantation. 4,317,686, Cl. 148-1.500.

Anchor Wire Corporation: *See—*
Hogg, James W., 4,317,555, Cl. 248-467.000.

Anderson, George W. Metal plated hair roller. 4,317,461, Cl. 132-40.000.

Anderson, Leo J., to Dow Chemical Company, The. Pipeline identification. 4,317,362, Cl. 73-37.000.

Anderson, Sidney E., to Deere & Company. Bearing arrangement with separable lubrication collar. 4,317,599, Cl. 308-187.000.

Andersson, Lars Y., to Hiab-Foco Aktiebolag. Hydraulic cranes. 4,317,524, Cl. 212-146.000.

Andersson, Roger: *See—*
Malmberg, Gunnar; Andersson, Roger; and Pettersson, Kjell, 4,317,324, Cl. 56-11.300.

Andrew Engineering, Inc.: *See—*
Shoquist, William A., 4,317,732, Cl. 210-744.000.

Angerman, GottFried; Armbrust, Otto; Dianitsch, Franz; and Hiebl, Berthold, to Carrera International Corporation. Sports goggle. 4,317,240, Cl. 2-436.000.

Angquist, Lennart, to Asea Aktiebolag. Electrical inverter with controllable output voltage. 4,318,167, Cl. 363-41.000.

Angst, Werner: *See—*
Degischer, Gerhard; and Angst, Werner, 4,317,916, Cl. 560-43.000.

Anken, Milton: *See—*
Halbert, Seymour P.; and Anken, Milton, 4,317,810, Cl. 424-12.000.

Aoki, Toshiaki: *See—*
Okuhara, Mitsuhiko; Nishino, Taizou; Kawamura, Kazuo; and Aoki, Toshiaki, 4,318,131, Cl. 358-210.000.

Aoyagi, Masao: *See—*
Isobe, Takashi; and Aoyagi, Masao, 4,317,627, Cl. 354-286.000.

Applied Process Technology, Inc.: *See—*
Christol, James T.; and Burchard, John S., 4,317,698, Cl. 156-626.000.

Arai, Takeshi: *See—*
Kanda, Shoichi; Oda, Toshikazu; Tanabe, Yasunosuke; and Arai, Takeshi, 4,317,759, Cl. 524-93.000.

Arakawa, Mitsuaki: *See—*
Crooks, Lawrence E.; Hoenninger, John C., III; and Arakawa, Mitsuaki, 4,318,043, Cl. 324-309.000.

Araki, Yoshihiko: *See—*
Hara, Hajime; Orii, Shingo; and Araki, Yoshihiko, 4,317,754, Cl. 525-501.500.

Arcari, Giuliana: *See—*
Temperilli, Aldemio; Mantegani, Sergio; Arcari, Giuliana; and Caravaggi, Anna M., 4,317,912, Cl. 546-199.000.

Archibald, James B.: *See—*
Armor, Anthony F.; Archibald, James B.; and Noel, David A., 4,317,952, Cl. 174-15.0BH.

Argyle, Percy E., to Canadian Patents and Development Limited. Apparatus for pattern recognition. 4,318,083, Cl. 340-146.30F.

Arichi, Shigeru; and Uchida, Yoshihiro, to Osaka Chemical Laboratory Co., Ltd. Saponin containing composition effective against adrenal atrophy. 4,317,816, Cl. 424-182.000.

Armbrust, Otto: *See—*
Angerman, GottFried; Armbrust, Otto; Dianitsch, Franz; and Hiebl, Berthold, 4,317,240, Cl. 2-436.000.

Armco Inc.: *See—*
Lawson, John E., 4,317,587, Cl. 285-137.00A.

Armor, Anthony F.; Archibald, James B.; and Noel, David A., to General Electric Company. Liquid cooled terminal boxes. 4,317,952, Cl. 174-15.0BH.

Armstrong, John T., to General Motors Corporation. Thrust bearing assembly method. 4,317,266, Cl. 29-148.40A.

Arndt, Friedrich: *See—*
Boroschewski, Gerhard; and Arndt, Friedrich, 4,317,674, Cl. 71-111.000.

Arnold, Erwin: *See—*
Gut, Edwin; Arnold, Erwin; and Friedli, Hans, 4,317,595, Cl. 299-94.000.

Artaud, Claude; and Ducruet, Henri, to Camiua. Telescopic aerial ladder. 4,317,504, Cl. 182-67.000.

Artos Engineering Company: *See—*
Gudmestad, Ragnar, 4,317,391, Cl. 81-9.510.

Aruga, Taketo; and Morita, Koichi, to Kabushiki Kaisha Komatsu Seisakusho. Hydraulic circuit for a hydraulically driven vehicle. 4,317,331, Cl. 60-436.000.

Asahi-Dow Limited: *See—*
Watanabe, Seizaburo; and Yamagishi, Tsukasa, 4,317,888, Cl. 521-79.000.

Asahi Glass Co. Ltd.: *See—*
Karasawa, Kunihiko; Hosoda, Tokushiro; Mase, Hiroshi; Sato, Yasuo; and Shimada, Shoji, 4,317,845, Cl. 427-47.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Horiguchi, Sadayuki; Hasegawa, Akio; and Shibukawa, Mitsuru, 4,317,882, Cl. 435-212.000.
Kawasaki, Hironobu; Yoshida, Kouichirou; and Itoh, Tomoo, 4,317,766, Cl. 524-101.000.

Asahi Kogaku Kohyo Company Limited: *See—*
Nobusawa, Tsukumo, 4,317,623, Cl. 354-60.00A.

Asai, Tatushi, to Brother Kogyo Kabushiki Kaisha. Overload release clutch. 4,317,511, Cl. 192-56.00R.

Asano, Masaharu; and Kanegae, Hidetoshi, to Nissan Motor Company, Limited. Self-testing control system for an internal combustion engine. 4,317,364, Cl. 73-117.300.

Asar Madhu P.; and Greene, Richard A., to Western Electric Company, Incorporated. Taping apparatus with dual tape applicator mechanisms. 4,317,695, Cl. 156-353.000.

Asea Aktiebolag: *See—*
Angquist, Lennart, 4,318,167, Cl. 363-41.000.
Johansson, Sven; Kolsmyr, Roland; Madsen, Kristian D.; and Polvi, Esko, 4,318,021, Cl. 310-260.000.
Olsson, Karl E., 4,318,169, Cl. 363-123.000.

Aso, Akira: *See—*
Yoshikawa, Toshihumi; Tani, Zempei; Aso, Akira; and Kawanabe, Hitoshi, 4,318,115, Cl. 357-30.000.

Atlantic Richfield Company: *See—*
Burk, Emmett H., Jr.; Yoo, Jin S.; and Karch, John A., 4,317,713, Cl. 208-113.000.
Taylor, Paul D.; and Mocella, Michael T., 4,317,801, Cl. 423-54.000.

Atsumi, Toshio; Sanjiki, Tetsutaro; and Kiyohara, Takao, to Sumitomo Chemical Company, Limited. Antitumor and immunosuppressive 4-carbamoyl imidazolium-5-olate derivatives. 4,317,825, Cl. 424-250.000.

Atwood, Eldon W.; and Johnson, Alfred E., to Dandi Products Limited. Truss. 4,317,316, Cl. 52-93.000.

Audemars, Daniel: *See—*
Simm, Wolfgang; Steine, Hans-Theo; and Audemars, Daniel, 4,317,540, Cl. 239-85.000.

Auracher, Franz: *See—*
Winzer, Gerhard; and Auracher, Franz, 4,317,699, Cl. 156-629.000.

Ausonia Farmaceutici S.r.l.: *See—*
De Vincentiis, Leonardo, 4,317,917, Cl. 560-72.000.

Australian Wire Industries Proprietary Limited: *See—*
Sander, Anthony J.; Sciffer, Jack P.; and Whitton, Richard W., 4,317,428, Cl. 118-623.000.

Automation Industrielle SA: *See—*
Sander, Engelbert, 4,317,420, Cl. 425-112.000.

AVL AG: *See—*
Fredericks, George E., 4,318,041, Cl. 324-71.00R.

Awater, Albert: *See—*
Goyert, Wilhelm; Awater, Albert; Grimm, Wolfgang; Ott, Karl-Heinz; Oberkirch, Wolfgang; and Wagner, Hans, 4,317,890, Cl. 525-66.000.

AZ Sellbergs AB: *See—*
Forslund, Sven E., 4,317,714, Cl. 209-44.000.

Baba, Masao: *See—*
Sato, Takahisa; Baba, Masao; and Okane, Michito, 4,317,926, Cl. 562-532.000.

Babb, Richard C.: *See—*
Calvin, Douglas G.; and Babb, Richard C., 4,317,384, Cl. 74-424.80A.

Babbidge, Lewis E. Self-closing, snap-open pouch and method of making same. 4,317,478, Cl. 150-10.000.

Bachman, Charles W.; and Bouvard, Jacques, to Honeywell Information Systems Inc. Deadlock detection and prevention mechanism for a computer system. 4,318,182, Cl. 364-200.000.

Baeker, Klaus: *See—*
Amtmann, Heribert; and Baeker, Klaus, 4,317,999, Cl. 250-413.000.

Bahrmann, Helmut: *See—*
Bernhagen, Wolfgang; Weber, Jurgen; Bahrmann, Helmut; and Springer, Helmut, 4,317,945, Cl. 568-853.000.

Bailey, Gregory D.; and Spector, George. Atra lube hair lubricating comb. 4,317,464, Cl. 132-113.000.

Baker International Corporation: *See—*
Ross, Richard J., 4,317,485, Cl. 166-216.000.

Balchin, David J., to Trident Equipment Limited. Earth leakage protection devices. 4,318,151, Cl. 361-45.000.

Balfour-Richie, Gordon A. Mattress cover for an inflatable air mattress. 4,317,244, Cl. 5-449.000.

Balis, M. Earl; Higgins, Paul J.; and Salser, Josephine S., to Sloan Kettering Institute. Process for detecting the presence of malignant and pre-malignant cells in humans. 4,317,877, Cl. 435-7.000.

Baptista, Roberto J., to Roanto Investment N.V. Golf club carrier. 4,317,477, Cl. 150-1.50B.

Bardsley, Donald E., to Ingersoll-Rand Company. Feeding device for use in filter presses. 4,317,724, Cl. 210-225.000.

Barker, Clark R.: *See—*
Summers, David A.; Barker, Clark R.; and Keith, H. Dean, 4,317,492, Cl. 175-79.000.

Barker, Clinton B.; and Wright, Martin E. J., to Engineering Components Limited. Gaskets. 4,317,576, Cl. 277-235.00B.

Barkhimer, Robert L.: *See—*
Galasan, Felixberto A.; Watson, Thomas H.; and Barkhimer, Robert L., 4,317,415, Cl. 105-378.000.

Barnard, Robert L. Protective two-piece cover boots for padlocks. 4,317,344, Cl. 70-55.000.

Barnhart, David E.; and Gates, Douglas R., to General Motors Corporation. Valve stem seal. 4,317,436, Cl. 123-188.00P.

Barnum, Harry W.: *See—*
Oswald, Alexis A.; Harting, Gary L.; and Barnum, Harry W., 4,317,737, Cl. 252-28.000.

Barr, Thomas A. Explosive gas detector. 4,317,796, Cl. 422-95.000.

Barre, Michel; and Carrion, Jean P., to Regie Nationale des Usines Renault. Retaining and locking arrangement for spare tire cradle. 4,317,533, Cl. 224-42.210.

Bart, Stan; and Srivastava, Gopal K., to Zenith Radio Corporation. Pulse width modulator for a television receiver. 4,318,036, Cl. 315-408.000.

Bartosevich, Joseph F.: *See—*
Klayman, Daniel L.; Scovill, John P.; Bartosevich, Joseph F.; Mason, Carl J.; and Griffin, T. Scott, 4,317,776, Cl. 260-244.400.

Baruffaldi Frizioni S.p.A.: *See*—
Zaninelli, Ettore, 4,317,396, Cl. 82-36.00A.
Bass, James S. Range and elevation adjustment for telescopic sight. 4,317,304, Cl. 42-1.0ST.
Batistelli, Nello. Process for producing a simulated weathered antique wood appearing finish. 4,317,847, Cl. 427-260.000.
Battelle Memorial Institute: *See*—
Mallozzi, Philip J.; Epstein, Harold M.; Schwerzel, Robert E.; and Campbell, Bernerd E., 4,317,994, Cl. 250-275.000.
Baughn, Eddie S.: *See*—
Thomas, O. Leon; and Baughn, Eddie S., 4,317,549, Cl. 242-157.00R.
Baum, Carl M.; and Rohe, William C., to Vanguard Diversified, Inc. Connection means for assembling furniture. 4,317,416, Cl. 108-157.000.
Baxa Corporation: *See*—
Smith, Philip E., 4,317,448, Cl. 128-272.300.
Baxamusa, Yusuf A.: *See*—
Robota, Stephen; and Baxamusa, Yusuf A., 4,317,805, Cl. 423-240.000.
Baxter Travenol Laboratories, Inc.: *See*—
Hannah, Richard E., 4,317,550, Cl. 248-95.000.
Robinson, Thomas P., 4,317,445, Cl. 128-214.400.
Bayer Aktiengesellschaft: *See*—
Eckstein, Udo; and Siegel, Edgar, 4,317,782, Cl. 260-932.000.
Fuchs, Rainer; Naumann, Klaus; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; and Stendel, Wilhelm, 4,317,834, Cl. 424-304.000.
Goyert, Wilhelm; Awater, Albert; Grimm, Wolfgang; Ott, Karl-Heinz; Oberkirch, Wolfgang; and Wagner, Hans, 4,317,890, Cl. 525-66.000.
Hoffmann, Hellmut, 4,317,783, Cl. 260-937.000.
Ludke, Heimo; Gunther, Peter; and Kleimann, Helmut, 4,317,791, Cl. 264-297.000.
Beardmore, John M., to General Motors Corporation. Fuel injector-pump unit with hydraulic needle fuel injector. 4,317,541, Cl. 239-88.000.
Becker, Reinhold: *See*—
Gord, Herbert; and Becker, Reinhold, 4,317,794, Cl. 264-559.000.
Becton, Dickinson and Company: *See*—
Gaydos, Joseph A., 4,317,473, Cl. 138-45.000.
Johnson, Luther R.; and Sapatino, Bruno V., 4,317,886, Cl. 435-285.000.
Percarpio, Edward P., 4,317,456, Cl. 128-766.000.
Reese, Max G.; and Hales, Richard H., 4,317,921, Cl. 562-444.000.
Beede, Charles H.; and Zirnite, Richard N., to Johnson & Johnson. Modifiers for ion-leachable cement compositions. 4,317,681, Cl. 106-85.000.
Behrenz, Wolfgang: *See*—
Fuchs, Rainer; Naumann, Klaus; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; and Stendel, Wilhelm, 4,317,834, Cl. 424-304.000.
Beisswenger, Siegfried: *See*—
Taudt, Heinz; Grieger, Dieter; and Beisswenger, Siegfried, 4,317,982, Cl. 219-121.0EN.
Bell Telephone Laboratories, Incorporated: *See*—
Biggs, Ronald D.; and Schuh, Peter O., 4,317,964, Cl. 179-81.00R.
Torok, Gabor P.; and White, Andrew B., 4,317,956, Cl. 178-18.000.
Wynn, Woodson D., 4,318,186, Cl. 365-8.000.
Belleville, Lawrence R. Knock-down ice chest. 4,317,527, Cl. 220-4.00F.
Bendix Corporation, The: *See*—
Casey, Gary L., 4,317,374, Cl. 73-861.530.
Freedman, Morris D.; Whiteside, Arliss E.; and Rothschild, Alexander M., 4,318,173, Cl. 364-200.000.
Fulmer, Keith H., 4,318,091, Cl. 340-626.000.
Jordan, David D., 4,317,338, Cl. 64-7.000.
Whiteside, Arliss E.; and Wolber, William G., 4,318,085, Cl. 340-347.0DA.
Bening, Curtis R., to Deere & Company. Safety start and shutdown system for vehicles having electrically activated power take-off. 4,317,500, Cl. 180-273.000.
Bennett, Arthur J.; and Roberts, Peter R. T., to Pye (Electronic Products) Ltd. Electron discharge tube cooling system. 4,317,336, Cl. 62-514.00R.
Bennett, Moreland P.; and Ettlinger, Louis F., to General Electric Company. Low resistance electric joint between conductive members, at least one member having an insulation coating thereon, and the method of making such joint. 4,317,277, Cl. 29-860.000.
Benson, Donald G., to Benson Industries Inc. Device for cleaning containers. 4,317,249, Cl. 15-213.000.
Benson, Harvey D.; Grunwell, Joyce F.; Johnston, John O.; and Petrow, Vladimir, to Richardson-Merrell Inc. Method of treating prostatic carcinoma. 4,317,818, Cl. 424-242.000.
Benson Industries Inc.: *See*—
Benson, Donald G., 4,317,249, Cl. 15-213.000.
Berg, Coleman D.: *See*—
Graham, Andrew S., Jr.; and Berg, Coleman D., 4,317,547, Cl. 242-55.300.
Berg, Michael: *See*—
Schulze, Ehrhart; and Berg, Michael, 4,317,656, Cl. 493-197.000.
Berg, Roger M. Broiler apparatus. 4,317,441, Cl. 126-41.00R.
Bergfeld, Manfred: *See*—
Zengel, Hans; and Bergfeld, Manfred, 4,317,947, Cl. 568-949.000.
Bernauer, Karl; and Pfoertner, Karlheinz, to Hoffmann-La Roche Inc. Oxazolines. 4,317,914, Cl. 548-239.000.
Bernhagen, Wolfgang; Weber, Jurgen; Bahrmann, Helmut; and Springer, Helmut, to Ruhrchemie Aktiengesellschaft. Process for preparing 2-methyl-2-sec.butyl-1,3-propanediol. 4,317,945, Cl. 568-853.000.
Bernhagen, Wolfgang: *See*—
Weber, Jurgen; Bernhagen, Wolfgang; and Springer, Helmut, 4,317,925, Cl. 562-531.000.
Berti, Franco: *See*—
Mancini, Giuseppe; Imparato, Luigi; and Berti, Franco, 4,317,780, Cl. 260-410.600.
Bertland, Alexander U.; and Lampson, George P., to Merck & Co., Inc. Herpes simplex type 1 subunit vaccine. 4,317,811, Cl. 424-89.000.
Bethlehem Steel Corporation: *See*—
Peeling, Richard C., 4,317,640, Cl. 403-36.000.
Biggs, Ronald D.; and Schuh, Peter O., to Bell Telephone Laboratories, Incorporated. Off-hook/on-hook status check circuit. 4,317,964, Cl. 179-81.00R.
Billman, Erwin A.: *See*—
Frank, William E.; and Billman, Erwin A., 4,317,979, Cl. 219-10.770.
Bishop, George F. L. Apparatus for supporting a container for liquid while dispensing. 4,317,551, Cl. 248-141.000.
Bittmann, Peter: *See*—
Rapp, Joachim; and Bittmann, Peter, 4,318,177, Cl. 364-502.000.
Bizerba-Werke Wilhelm Kraut KG: *See*—
Kuhnle, Ernst; and Schwarz, Josef, 4,317,495, Cl. 177-157.000.
Blackburn, Althea, administratrix: *See*—
Blackburn, Reginald M., deceased, 4,317,260, Cl. 19-107.000.
Blackburn, Reginald M., deceased (by Blackburn, Althea, administratrix), to Platt Saco Lowell Limited. Method improvement to increase the proportion of usable fibers in processable textile fiber stock. 4,317,260, Cl. 19-107.000.
Blackwell, Henry W., to Dresser Industries, Inc. Swab cup having an internal reinforcing member. 4,317,407, Cl. 92-241.000.
Blair, James E.; and Davis, Lois T., to Sybron Corporation. Microbiological process for removing non-ionic surface active agents, detergents and the like from wastewater and microorganism capable of same. 4,317,885, Cl. 435-253.000.
Blake, Minden V. Instructional and/or teaching devices for ball games. 4,317,567, Cl. 273-26.00B.
Blet, Louis J. C.: *See*—
Guillaumon, Jean-Claude; and Blet, Louis J. C., 4,317,855, Cl. 428-212.000.
Blinkhorn, Francis E.: *See*—
Russo, Ronald D.; Blinkhorn, Francis E.; and Curado, Len L., 4,317,452, Cl. 128-350.00R.
Blohm, Thomas R.; and Metcalf, Brian W., to Richardson-Merrell Inc. Novel steroid 5α-reductase inhibitors. 4,317,817, Cl. 424-226.000.
Bloom, Gordon E., to Litton Systems, Inc. Optimum topology high voltage DC to DC converter. 4,318,166, Cl. 363-26.000.
Blount, David H. Process for the production of polyisocyanate lignin-cellulose plastics. 4,317,752, Cl. 521-159.000.
Bluestein, Ben A.; and Evans, E. Robert, to General Electric Company. Process for producing fluorosilicone polymers. 4,317,899, Cl. 528-14.000.
Blum, Patricia R.; and Nicholas, Mark L., to Standard Oil Company (SOHIO). Preparation of maleic anhydride using fluidized catalysts. 4,317,778, Cl. 260-346.750.
Bock, Ditmar H., to Calspan Corporation. Phase shifter control circuit. 4,318,048, Cl. 328-155.000.
Boeing Company, The: *See*—
Steadman, Stephen T., 4,317,424, Cl. 116-56.000.
Boellmann, Horst E., to Per-Fil Industries. Pellet molding apparatus. 4,317,649, Cl. 425-150.000.
Bogner, Max; and Grun, Larry, to Four Stars Jewelry Corp. Means and method for making jewelry. 4,317,264, Cl. 29-8.000.
Boice, Elvin G., to Reynolds Metals Company. Torqued drill pipe identification. 4,317,585, Cl. 285-93.000.
Bojko, Jury A.: *See*—
Vasilenko, Vladimir I.; Krakovetsky-Kocherzhinsky, Jury A.; Shishkin, Evgeny A.; and Bojko, Jury A., 4,317,360, Cl. 73-15.00B.
Bolcavage, Richard D.; Hryck, Michael D.; Kauczka, William B.; and Kinter, Harold B., to International Business Machines Corporation. Control system and method for testing print hammers in a high speed printer. 4,317,412, Cl. 101-93.010.
Bolick, Virgil: *See*—
Brownell, Kenneth W.; Bolick, Virgil; Carswell, Joseph; and Hazenfield, Robert C., 4,317,953, Cl. 174-21.00R.
Bollinger, Frederic G., to Monsanto Company. Substituted 2-imino-1,3-dithio and 1,3-oxathio heterocyclic compounds as herbicidal antidotes. 4,317,310, Cl. 47-57.600.
Bond, Gary M.: *See*—
Marshall, Albert H.; Bond, Gary M.; and Shaw, Bon F., 4,317,651, Cl. 434-22.000.
Marshall, Albert H.; Bond, Gary M.; and Shaw, Bon F., 4,317,652, Cl. 434-22.000.
Boorman, Roy S.: *See*—
Wilkomirsky, Igor A. E.; Boorman, Roy S.; and Salter, Robert S., 4,317,803, Cl. 423-99.000.
Boothe, James H.: *See*—
Sassiver, Martin L.; and Boothe, James H., 4,317,774, Cl. 260-239.100.
Borom, Marcus P.: *See*—
Ahuja, Pritam L.; and Borom, Marcus P., 4,317,685, Cl. 134-2.000.

Boroschewski, Gerhard; and Arndt, Friedrich, to Schering AG. Diurethanes, process for making the same and selective herbicide composition containing same. 4,317,674, Cl. 71-111.000.

Borrows, John G., to Fisher & Paykel Limited. Methods of and/or apparatus for punching holes in sheet metal. 4,317,351, Cl. 72-186.000.

Boss, Gerald R.; and Bueno, Alejandro G., to Libbey-Owens-Ford Company. Glass melting furnace having a submerged weir. 4,317,669, Cl. 65-135.000.

Bottoms, Clifford C. Mud pump piston assembly. 4,317,409, Cl. 92-244.000.

Boudeau, Jean-Michel; Logue, Michel; and Parisot, Claude, to Societe des Electrodes et Refractaires Savoie (SERS). Nippled joint for furnace electrode. 4,317,951, Cl. 13-18.00C.

Bouvard, Jacques: *See*—
Bachman, Charles W.; and Bouvard, Jacques, 4,318,182, Cl. 364-200.000.

Bowden, Donald R.; and Novell, Bruce J., to Solar Limited, Inc. Process for making a heater exchanger. 4,317,268, Cl. 29-157.3AH.

Bowen, Mack D.; and Purdy, Kenneth R., to American Can Company. Pyrolysis process utilizing pyrolytic oil recycle. 4,317,703, Cl. 201-1.000.

Bowers, John E.; and Schmit, Joseph L., to Honeywell Inc. Mercury containment for liquid phase growth of mercury cadmium telluride from tellurium-rich solution. 4,317,689, Cl. 148-171.000.

Bradshaw, John: *See*—
Clitherow, John W.; Price, Barry J.; Bradshaw, John; and Martin-Smith, Michael, 4,317,819, Cl. 424-244.000.

Bradshaw, Robert F. D.; and Brokenshire, John L., to U.S. Philips Corp. Trace vapor detector. 4,317,995, Cl. 250-288.000.

Brady, Thomas J.: *See*—
Krupa, John E.; Magness, Preston L.; and Brady, Thomas J., 4,318,045, Cl. 328-18.000.

Brambilla, Edgardo; and Horman, Ian, to Societe D'Assistance Technique Pour Produits Nestle S.A. Process for the deacidification of a coffee extract. 4,317,841, Cl. 426-239.000.

Brankovics, Mihaly. Water turbine generator system. 4,317,330, Cl. 60-398.000.

Braslaw, Jacob: *See*—
Gerlock, John L.; Braslaw, Jacob; and Albright, Jane, 4,317,939, Cl. 568-121.000.

Breglia, Denis R.; and Rodemann, Alfred H., to United States of America, Navy. Holographic terrain surface display system. 4,317,610, Cl. 350-3.770.

Bridgestone Tire Company Limited: *See*—
Honda, Toshio; Tanuma, Itsuo; Ogawa, Masao; Ishikawa, Hikaru; Fukuura, Yukio; Akiyama, Setsuo; Ojima, Shozo; and Naito, Kazuo, 4,317,862, Cl. 428-442.000.

Brinly-Hardy Co., Inc.: *See*—
Doering, Charles W., 4,317,327, Cl. 56-396.000.

Bristol, Robert G.: *See*—
Scott, Charles E.; Smith, Robert L.; and Bristol, Robert G., 4,318,084, Cl. 340-309.100.

British National Oil Corporation, The: *See*—
Shotbolt, Keith, 4,317,488, Cl. 166-351.000.

Broacha, Firoze H.: *See*—
Sivachenko, Eugene W.; and Broacha, Firoze H., 4,317,350, Cl. 72-177.000.

Brodeur, Lester R., to Sanders Associates, Inc. Loran-C navigation apparatus. 4,318,105, Cl. 343-103.000.

Brokenshire, John L.: *See*—
Bradshaw, Robert F. D.; and Brokenshire, John L., 4,317,995, Cl. 250-288.000.

Broome, Barry G.: *See*—
Frankel, Denes E.; Dobkin, Robert C.; and Broome, Barry G., 4,318,089, Cl. 340-567.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Asai, Tatushi, 4,317,511, Cl. 192-56.00R.

Brownell, Kenneth W.; Bolick, Virgil; Carswell, Joseph; and Hazenfield, Robert C., to Akzona Incorporated. Strain relief for cable splice closures. 4,317,953, Cl. 174-21.00R.

Brundage, Ruth P.: *See*—
Lesher, George Y.; and Brundage, Ruth P., 4,317,909, Cl. 544-127.000.

Bruning, Donald D., to Phillips Petroleum Company. Viscosity-stabilized aqueous solutions. 4,317,758, Cl. 524-202.000.

Brunswick Corporation: *See*—
Schiek, James M., 4,317,655, Cl. 440-78.000.

Brunton & Brunton Pty. Ltd.: *See*—
Brunton, Robert E., 4,317,570, Cl. 273-246.000.

Brunton, Robert E., to Brunton & Brunton Pty. Ltd. Game with simulated game piece. 4,317,570, Cl. 273-246.000.

Bryan, Emanuel. Protective shield for ultraviolet lamps. 4,318,163, Cl. 362-359.000.

Bryksa, Nicholas. Protective helmet for the retarded. 4,317,239, Cl. 2-411.000.

Bubnich, Frank J.; and Bubnich, Marketta A. Vehicle parking aid. 4,318,077, Cl. 340-51.000.

Bubnich, Marketta A.: *See*—
Bubnich, Frank J.; and Bubnich, Marketta A., 4,318,077, Cl. 340-51.000.

Bucalo, Louis. Methods and devices for obtaining specimens and for signalling when the specimen has been collected. 4,317,454, Cl. 128-759.000.

Buchman, Henry J.: *See*—
Ambrosio, Thomas J.; Buchman, Henry J.; Rogus, Joseph J.; and Sochon, Henry R., 4,317,446, Cl. 128-218.00R.

Buchwald, Melvin I.; Jones, Claude R.; and Nelson, Leonard Y., to United States of America, Energy. Optically pumped isotopic ammonia laser system. 4,318,057, Cl. 372-70.000.

Buck, Ronald G., to Litton Systems, Inc. Power controlled microwave oven. 4,317,977, Cl. 219-10.55B.

Bueno, Alejandro G.: *See*—
Boss, Gerald R.; and Bueno, Alejandro G., 4,317,669, Cl. 65-135.000.

Bundy, Gordon L., to Upjohn Company, The. 2-Decarboxy-2-hydroxymethyl-trans-2,3-didehydro-9-deoxy-9-methylene-PGF compounds. 4,317,941, Cl. 568-646.000.

Bunker Ramo Corporation: *See*—
Hawley, Kenneth R., 4,318,175, Cl. 364-200.000.

Burchard, John S.: *See*—
Christol, James T.; and Burchard, John S., 4,317,698, Cl. 156-626.000.

Burgess, Emerson F., to Silva Restaurant Equipment Co., Inc. Remote refrigeration system with controlled air flow. 4,317,334, Cl. 62-183.000.

Burk, Emmett H., Jr.; Yoo, Jin S.; and Karch, John A., to Atlantic Richfield Company. In situ aluminum passivation process. 4,317,713, Cl. 208-113.000.

Burkhart, John M.: *See*—
Emrich, Robert K.; Prather, William H.; and Burkhart, John M., 4,317,300, Cl. 37-142.00R.

Burri, Kasper F.; and Rosen, Perry, to Hoffmann-La Roche Inc. Amoxicillin derivatives. 4,317,775, Cl. 260-239.100.

Burroughs Corporation: *See*—
Frandsen, Jorgen, 4,318,145, Cl. 360-106.000.

Burroughs Wellcome Co.: *See*—
Thorogood, Peter B., 4,317,830, Cl. 424-273.00R.

Burysek, Frantisek; and Dykast, Jaroslav, to Vyzkumny ustav bavlnarsky. Method of and apparatus for exchanging full bobbins for empty ones in textile machines, particularly open-end spinning machines. 4,317,545, Cl. 242-18.00A.

Burzin, Klaus, to Chemische Werke Huels, Aktiengesellschaft. Odoriferous 2-alkoxyethyl-cycloalkyl-ethers. 4,317,942, Cl. 568-670.000.

Busby, Michael G.; and Hartwig, Diane E., to Airco, Inc. Glucose analyzer membrane containing immobilized glucose oxidase. 4,317,879, Cl. 435-14.000.

Butcher, John B.: *See*—
Anand, Kranti V.; and Butcher, John B., 4,317,686, Cl. 148-1.500.

Butkovsky, Anatoly G.: *See*—
Chubarov, Evgeny P.; Kubyshkin, Viktor A.; Mitrofanov, Vladimir E.; Emelyanov, Alexandr N.; Butkovsky, Anatoly G.; Norkin, Kemer B.; Aizenshtein, Anatoly G.; Kolomeitseva, Margarita B.; Suvorov, Arthur M.; and Vazhnov, Sergei A., 4,317,981, Cl. 219-121.0EA.

Byington, Roy E.; and Pease, William M., to Raytheon Company. Multiple channel digital memory system. 4,318,183, Cl. 364-900.000.

Byk Gulden Lomberg Chemische Fabrik GmbH: *See*—
Rainer, Georg, 4,317,823, Cl. 424-248.540.

C. R. Bard, Inc.: *See*—
Russo, Ronald D.; Blinkhorn, Francis E.; and Curado, Len L., 4,317,452, Cl. 128-350.00R.

Cabalfin, Rolando V. Power inverter oscillator circuit. 4,318,170, Cl. 363-133.000.

Cahen, Raymond M., to Labofina S.A. Process for producing purified terephthalic acid. 4,317,924, Cl. 562-487.000.

Calspan Corporation: *See*—
Bock, Ditmar H., 4,318,048, Cl. 328-155.000.

Calvin, Douglas G.; and Babb, Richard C., to Tapco International, Inc. Manual override drive apparatus. 4,317,384, Cl. 74-424.80A.

Cameron, Gordon N. Rotary expandable tool with hydraulic internal intensifier. 4,317,577, Cl. 279-2.00A.

Camiua: *See*—
Artaud, Claude; and Ducruet, Henri, 4,317,504, Cl. 182-67.000.

Camp, Douglas M., to Teams, Inc. Replacement wheel assembly for freight car door and method of installing. 4,317,255, Cl. 16-102.000.

Campbell, Bernerd E.: *See*—
Mallozzi, Philip J.; Epstein, Harold M.; Schwerzel, Robert E.; and Campbell, Bernerd E., 4,317,994, Cl. 250-275.000.

Campbell, Joseph K. Pipe stress/strain neutralizer. 4,317,586, Cl. 285-95.000.

Canadian Patents and Development Limited: *See*—
Argyle, Percy E., 4,318,083, Cl. 340-146.30F.

Canon Kabushiki Kaisha: *See*—
Isobe, Takashi; and Aoyagi, Masao, 4,317,627, Cl. 354-286.000.
Shimizu, Masami, 4,317,628, Cl. 354-288.000.
Watanabe, Tsuyoshi; Murase, Hidetoshi; Murayama, Akira; and Nakasugi, Mikio, 4,317,270, Cl. 29-447.000.

Caravaggi, Anna M.: *See*—
Temperilli, Aldemio; Mantegani, Sergio; Arcari, Giuliana; and Caravaggi, Anna M., 4,317,912, Cl. 546-199.000.

Carlson, David E., to RCA Corporation. Semiconductor device having a body of amorphous silicon and method of making the same. 4,317,844, Cl. 427-39.000.

Carlstrom, Per; and Persson, Gert, to Dynapac Maskin AB. Surface finishing machine. 4,317,314, Cl. 51-177.000.

Carmon, Amiram; and Lowe, Daniel, to Ipco Corporation. Method for manufacturing a disposable electrode. 4,317,278, Cl. 29-878.000.

Carrera International Corporation: *See*—
Angerman, GottFried; Armbrust, Otto; Dianitsch, Franz; and Hiebl, Berthold, 4,317,240, Cl. 2-436.000.

Carrion, Jean P.: *See*—
Barre, Michel; and Carrion, Jean P., 4,317,533, Cl. 224-42.210.

Carswell, Joseph: *See—*
Brownell, Kenneth W.; Bolick, Virgil; Carswell, Joseph; and Hazenfield, Robert C., 4,317,953, Cl. 174-21.00R.
Carter, Betty J.: *See—*
Lewarchik, Ronald J.; and Carter, Betty J., 4,317,894, Cl. 525-455.000.
Cartwright, David, to Imperial Chemical Industries Limited. Herbicidal pyridine compounds. 4,317,913, Cl. 546-345.000.
Casey, Gary L., to Bendix Corporation, The. Compensated vane airflow meter. 4,317,374, Cl. 73-861.530.
Cassani, Giorgio: *See—*
Massardo, Pietro; Cassani, Giorgio; and Piccardi, Paolo, 4,317,905, Cl. 542-413.000.
Castano, Gregory, to Stoughton Tool & Die Co., Inc. Lathe stop. 4,317,395, Cl. 82-34.00D.
Castera, Jean-Paul; and Dupont, Jean-Marie, to Thomson-CSF. Tunable microwave oscillator using magnetostatic waves. 4,318,061, Cl. 331-107.00A.
Castolin S.A.: *See—*
Simm, Wolfgang; Steine, Hans-Theo; and Audemars, Daniel, 4,317,540, Cl. 239-85.000.
Catalyst Research Corporation: *See—*
Folus, Stanford G., 4,317,869, Cl. 429-128.000.
Caterpillar Tractor Co.: *See—*
Marchal, Claude; and Van Espen, Christian, 4,317,588, Cl. 292-341.140.
Cavicchio, Ernest A., to GAF Corporation. High temperature gasket. 4,317,575, Cl. 277-227.000.
Celanese Corporation: *See—*
Dalton, Charles A.; and Slinkard, William E., 4,317,927, Cl. 562-535.000.
Centre National d'Etudes Spatiales: *See—*
Guillaumon, Jean-Claude; and Blet, Louis J. C., 4,317,855, Cl. 428-212.000.
Cerwin, Robert J.; and McVay, William P., to Ethicon, Inc. Plastic surgical staple. 4,317,451, Cl. 128-325.000.
Chaddock, Dennis H., to Perkins & Powell Limited. Door closer. 4,317,254, Cl. 16-61.000.
Chakravarti, Bhaven, to Combustion Engineering, Inc. Method of making metal tubes. 4,317,271, Cl. 29-527.600.
Chalmers, Edward; and Huggins, William H. Method of epilation. 4,317,450, Cl. 128-303.130.
Champion International Corporation: *See—*
Gaylord, Norman G., 4,317,765, Cl. 523-204.000.
Mode, Duane R., 4,317,518, Cl. 206-626.000.
Chandavoine, Marie-Madeleine: *See—*
Pigerol, Charles; Chandavoine, Marie-Madeleine; and de Cointet de Fillain, Paul, 4,317,768, Cl. 524-99.000.
Chang, John C. H., to Wallace Business Forms, Inc. Process for making microcapsules and resulting product. 4,317,743, Cl. 252-316.000.
Charlton, Marshall J., to Manville Service Corporation. Traffic channeling device. 4,317,617, Cl. 350-97.000.
Chase, Thomas G.; and Poniatowski, Steven, to American Roller Company. Electrically conductive elastomers. 4,317,265, Cl. 29-132.000.
Chauvier, Fernand L. O. J. System for cleaning the interior surface area of a vessel. 4,317,243, Cl. 4-490.000.
Chea, Ramon C. W., Jr., to International Telephone and Telegraph Corporation. Subscriber line interface circuit utilizing impedance synthesizer and shared voltage source for loop current regulation control. 4,317,963, Cl. 179-77.000.
Chemische Werke Huels, Aktiengesellschaft: *See—*
Burzin, Klaus, 4,317,942, Cl. 568-670.000.
Herrmann, Christoph; and Streck, Roland, 4,317,897, Cl. 526-116.000.
Chemische Werke Huls Aktiengesellschaft: *See—*
Schnurbusch, Horst; Gras, Rainer; and Wolf, Elmar, 4,317,900, Cl. 528-59.000.
Chen, Catherine S. H.; and Sheppard, Edward W., to Mobil Oil Corporation. Oil recovery by waterflooding employing an anionic polymeric surfactant containing recurring succinimide or succinamide groups. 4,317,893, Cl. 525-328.000.
Chen, De Y.: *See—*
Kornrumpf, William P.; Park, John N.; and Chen, De Y., 4,318,165, Cl. 363-21.000.
Chen, Hsing-Yao: *See—*
Hughes, Richard H.; and Chen, Hsing-Yao, 4,318,027, Cl. 315-15.000.
Cherukuri, Subraman R.; and Friello, Dominick R., to Life Savers, Inc. Method for applying sugarless coating to chewing gum and confections. 4,317,838, Cl. 426-5.000.
Cheung, Wing S.: *See—*
Torok, John; McCaffrey, Eugene F.; Riem, Roland H.; and Cheung, Wing S., 4,317,748, Cl. 252-472.000.
Chevron Research Company: *See—*
Hubred, Gale L.; and Lewis, Robert T., 4,317,730, Cl. 210-695.000.
Chicago Bridge & Iron Company: *See—*
Pollack, Jack, 4,317,421, Cl. 114-230.000.
Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt.: *See—*
Palosi, Endre; Korbonits, Dezso; Kiss, Pal; Gonczy, Csaba; Heja, Gergely; Cser nee Kun, Judit; Szebeni, Rudolf; Szomor nee Wundele, Maria; and Szvoboda nee Kanzel, Ida, 4,317,920, Cl. 562-440.000.
Chlorine Engineers Corp., Ltd.: *See—*
Ichisaka, Teruo; and Shinomiya, Yoshitugu, 4,317,709, Cl. 204-268.000.
Choi, Oh Y. Barbed wire. 4,317,955, Cl. 174-126.0CP.
Chore-Time Equipment, Inc.: *See—*
Swartzendruber, Ray E., 4,317,430, Cl. 119-52.0AF.
Christol, James T.; and Burchard, John S., to Applied Process Technology, Inc. End point detection in etching wafers and the like. 4,317,698, Cl. 156-626.000.
Chromalloy American Corporation: *See—*
Kilts, Harold J.; and Swaziek, Laurence J., 4,317,317, Cl. 52-224.000.
Chu, Chang K.; and Vomish, George W., to Westinghouse Electric Corp. Diffusion source and method of preparing. 4,317,680, Cl. 75-134.00S.
Chubarov, Evgeny P.; Kubyshkin, Viktor A.; Mitrofanov, Vladimir E.; Emelyanov, Alexandr N.; Butkovsky, Anatoly G.; Norkin, Kemer B.; Aizenshtein, Anatoly G.; Kolomeitseva, Margarita B.; Suvorov, Arthur M.; and Vazhnov, Sergei A. Method and apparatus for controlling a movable energy source when it is operated to heat the surface of an object. 4,317,981, Cl. 219-121.0EA.
Chuman, Tatsuji; Kono, Masahiro; and Kato, Kunio, to Japan Tobacco & Salt Public Corporation, The. 4-6-Dimethyl-7-keto-nonan-3-ol and sex attractant comprising the same. 4,317,836, Cl. 424-331.000.
Chung, Sam: *See—*
Tanaka, Kunihide; Elliott, Michael T.; Chung, Sam; Pau, James; Gray, Linda; Hou, Liping D.; F'Mayer, Mary; Warren, David; and Finch, Karen, 4,317,700, Cl. 156-652.000.
Ciba-Geigy Corporation: *See—*
Degischer, Gerhard; and Angst, Werner, 4,317,916, Cl. 560-43.000.
Model, Ernst, 4,317,929, Cl. 564-249.000.
Rasberger, Michael; and Karrer, Friedrich, 4,317,911, Cl. 544-222.000.
Cibulka, Josef: *See—*
Winkler, Jiri; and Cibulka, Josef, 4,318,171, Cl. 363-138.000.
Ciummo, Victor L. Vacuum cleaner attachment. 4,317,664, Cl. 55-434.000.
Civier, Danielle: *See—*
Groult, Pierre; Civier, Danielle; and Prehaut, Jacques, 4,317,789, Cl. 264-105.000.
CKD PRAHA, Oborovy podnik: *See—*
Winkler, Jiri; and Cibulka, Josef, 4,318,171, Cl. 363-138.000.
Claasen, Theodoor A. C. M.: *See—*
Peek, Johannes B. H.; Mecklenbrauker, Wolfgang F. G.; Claasen, Theodoor A. C. M.; and van Hurck, Nicolaas, 4,318,086, Cl. 340-347.0AD.
Claremon, David A.: *See—*
Nicolaou, Kyriacos C.; Magolda, Ronald L.; and Claremon, David A., 4,317,935, Cl. 568-445.000.
Clarion Co., Ltd.: *See—*
Nozaki, Akira, 4,317,974, Cl. 200-330.000.
Clark, Reginald H.; MacArthur, John D.; Sayer, Michael; and Wilder, William D., to Resource Recovery Limited. Apparatus and method for sorting articles. 4,317,521, Cl. 209-558.000.
Clarke, Raymond, to Raychem Corporation. Fluorosiloxane optical cladding. 4,317,616, Cl. 350-96.340.
Clitherow, John W.; Price, Barry J.; Bradshaw, John; and Martin-Smith, Michael, to Glaxo Group Limited. Amine derivatives. 4,317,819, Cl. 424-244.000.
Closson, Thomas A.: *See—*
Seitchik, Jerold A.; Closson, Thomas A.; Oxford, David B.; and Schenck, Stephen R., 4,318,187, Cl. 365-8.000.
Colles, Joseph H., to Hughes Aircraft Company. Wideband high voltage video amplifier. 4,318,052, Cl. 330-255.000.
Collins, William J. Device for obtaining a sample of molten material and methods of assembling components thereof. 4,317,380, Cl. 73-864.560.
Collum, Paulette: *See—*
Martin, Jerry R.; Tadanikr, John S.; and Collum, Paulette, 4,317,904, Cl. 536-17.00R.
Combustion Engineering, Inc.: *See—*
Chakravarti, Bhaven, 4,317,271, Cl. 29-527.600.
ComGeneral Corporation: *See—*
Roettele, Donald L.; and Yohpe, William E., 4,318,103, Cl. 343-18.00E.
Compagnine Generale de Geophysique: *See—*
Gleize, Jacques, 4,317,501, Cl. 181-121.000.
Concast AG: *See—*
Wolf, Manfred, 4,317,482, Cl. 164-454.000.
Confalone, Pasquale N.; Pizzolato, Giacomo; Uskokovic, Milan R.; and Rouge, Marianne, to Hoffmann-La Roche Inc. Novel thiophene derivatives. 4,317,915, Cl. 549-68.000.
Conn, Bartley R., to U. D. P., Inc. Pivoted two-section carpenter's level. 4,317,289, Cl. 33-498.000.
Conry, Raymond F. Walk behind, steerable wheeled toy. 4,317,307, Cl. 46-210.000.
Container Corporation of America: *See—*
Dickerson, Robert B., 4,317,536, Cl. 229-34.00R.
Nauheimer, James F., 4,317,537, Cl. 229-42.000.
Contraves AG: *See—*
Ebner, Walter; Kramis, Werner; and Studer, Gustav, 4,317,405, Cl. 89-37.00G.
Control Data Corporation: *See—*
Rank, William J.; and Whalen, Michael J., 4,318,157, Cl. 361-386.000.
Coppa, Richard J.; Lim, James K.; and Rodriguez, Marie T., to Polaroid Corporation. Variable proportional fill flash. 4,317,620, Cl. 354-33.000.
Cordis Laboratories, Inc.: *See—*
Halbert, Seymour P.; and Anken, Milton, 4,317,810, Cl. 424-12.000.

Cordova, Ronald J.; Peters, Edmund J.; and Martin, James S., to United States of America, Air Force. Real time digital recording system for thermovision data. 4,318,137, Cl. 360-32.000.

Costa, Lawrence C., to Halcon SD Group, Inc., The. Process for producing ethylene glycol via catalytic hydrogenation of glycolaldehyde. 4,317,946, Cl. 568-862.000.

Cosway, Harry F., to Formica Corporation. Method for the production of a powdered phenolic resole resin. 4,317,901, Cl. 528-139.000.

Cottin, Claude; and Le Veux, Bernard, to Regie Nationale des Usines Renault. Protective device for the occupants of a motor vehicle. 4,317,582, Cl. 280-751.000.

Cotton, John M.: *See*—
Cox, John E.; Treiber, Robert; and Cotton, John M., 4,317,962, Cl. 179-18.0ES.

Courshon, Jacob B., Jr.; and Rutkay, Nicholas G., to Plibrico Company. Tile hanger assembly. 4,317,418, Cl. 110-331.000.

Cowap, Frederic W.: *See*—
Stratton, Larry J.; Norini, Richard A.; Davis, Peter G.; Dyskievicz, Steve M.; Cowap, Frederic W.; Haskin, Roger L.; Gagner, Mark B.; and Mynett, Thomas M., 4,318,176, Cl. 364-469.000.

Cowles, Arthur L.; and Ensign, Thomas C., to Minnesota Mining and Manufacturing Company. Means for checking battery voltage level. 4,318,092, Cl. 340-636.000.

Cox, John E.; Treiber, Robert; and Cotton, John M., to International Telephone and Telegraph Corporation. Distributed control for digital switching system. 4,317,962, Cl. 179-18.0ES.

Coy, David H.; and Schally, Andrew V. LH-RH Antagonists. 4,317,815, Cl. 424-177.000.

CPC International Inc.: *See*—
Heady, Robert E., 4,317,880, Cl. 435-94.000.

Cragoe, Edward J., Jr.; Stokker, Gerald E.; and Gould, Norman P., to Merck & Co., Inc. [(5,6,9a-Substituted-3-oxo-1,2,9,9a-tetrahydro-3H-fluoren-7-yl)oxy]alkanoic and cycloalkanoic acids and their analogs, esters, salts and derivatives. 4,317,922, Cl. 562-461.000.

Cragoe, Edward J., Jr.: *See*—
Wolterstorf, Otto W., Jr.; and Cragoe, Edward J., Jr., 4,317,822, Cl. 424-249.000.

Crane Co.: *See*—
Sherlaw, Michael, 4,317,558, Cl. 251-306.000.

Crawford, Robert J., to Procter & Gamble Company, The. Alpha-sulfoxide and alpha-sulfone carboxyl compounds. 4,317,779, Cl. 260-400.000.

Crochet, Pierre: *See*—
Pierrot, Robert; Gautier, Francois; and Crochet, Pierre, 4,318,107, Cl. 343-700.0MS.

Crooks, Lawrence E.; Hoenninger, John C., III; and Arakawa, Mitsuaki, to University of California, The Regents of the. Method and apparatus for rapid NMR imaging of nuclear densities within an object. 4,318,043, Cl. 324-309.000.

Crosby, Gary A.: *See*—
Rapp, Walter W.; and Crosby, Gary A., 4,317,723, Cl. 210-202.000.

Crowe, Curtis W., to Dow Chemical Company, The. Method of inhibiting crosslinking of aqueous xanthan gums in the presence of ferric acid ions. 4,317,735, Cl. 252-8.55C.

Crowley, Norman: *See*—
Fuchs, Gilbert; Crowley, Norman; and Wink, Randall, 4,317,694, Cl. 156-256.000.

Cser nee Kun, Judit: *See*—
Palosi, Endre; Korbonits, Dezso; Kiss, Pal; Gonczy, Csaba; Heja, Gergely; Cser nee Kun, Judit; Szebeni, Rudolf; Szomor nee Wundele, Maria; and Szvoboda nee Kanzel, Ida, 4,317,920, Cl. 562-440.000.

Curado, Len L.: *See*—
Russo, Ronald D.; Blinkhorn, Francis E.; and Curado, Len L., 4,317,452, Cl. 128-350.00R.

Daiichi Seiyaku Co., Ltd.: *See*—
Shiba, Tetsuo; Kotani, Shozo; Yamamura, Yuichi; Nagase, Osamu; and Ogawa, Hidemasa, 4,317,771, Cl. 260-112.50R.

Dainippon Ink and Chemicals, Inc.: *See*—
Tsuda, Katsuhiro; Tanaka, Hisao; Nagae, Michio; and Imanaga, Yasuhiko, 4,317,760, Cl. 524-111.000.

Dainippon Screen Seizo Kabushiki Kaisha: *See*—
Ono, Yoshio; Sakamoto, Takashi; and Sano, Tetsuo, 4,318,003, Cl. 250-548.000.

Dais Corporation: *See*—
Whitfield, John H., 4,318,076, Cl. 340-27.0NA.

Dale, Robert W.; and Rooney, John J., to Gallaher Limited. Smoking products. 4,317,460, Cl. 131-334.000.

Dalfonso, Ralph J.: *See*—
Tiebor, John E.; Spongr, Jerry J.; and Dalfonso, Ralph J., 4,317,997, Cl. 250-308.000.

Dalton, Charles A.; and Slinkard, William E., to Celanese Corporation. Process for the catalytic conversion of olefinically unsaturated aldehydes to their corresponding acids. 4,317,927, Cl. 562-535.000.

D'Amato, Ralph J., to RCA Corporation. Method of making a grid for a cathode-ray tube electron gun. 4,318,026, Cl. 313-448.000.

Damouth, David E., to Xerox Corporation. Two section charging electrodes for binary ink drop printers. 4,318,111, Cl. 346-75.000.

Dana Corporation: *See*—
Wojcikowski, Richard J., 4,317,388, Cl. 74-574.000.

Dandi Products Limited: *See*—
Atwood, Eldon W.; and Johnson, Alfred E., 4,317,316, Cl. 52-93.000.

Dantzig, Jonathan A.; and Tyler, Derek E., to Swiss Aluminium Ltd. Method and apparatus for the degassing of molten metal. 4,317,679, Cl. 75-93.00E.

Dapper, Gerrit: *See*—
Sloterdijk, Wijtze; Dapper, Gerrit; Verbraak, Cornelis A.; and Kirchner, Willem, 4,317,800, Cl. 423-1.000.

Data Packaging Corporation: *See*—
Pepicelli, Pasquale L.; and Yonkers, Edward, 4,317,603, Cl. 312-9.000.

Davis, Gary C., to General Electric Company. Preparation of 2,2-bis(4-hydroxyphenyl) propane. 4,317,944, Cl. 568-728.000.

Davis, Lois T.: *See*—
Blair, James E.; and Davis, Lois T., 4,317,885, Cl. 435-253.000.

Davis, Peter G.: *See*—
Stratton, Larry J.; Norini, Richard A.; Davis, Peter G.; Dyskievicz, Steve M.; Cowap, Frederic W.; Haskin, Roger L.; Gagner, Mark B.; and Mynett, Thomas M., 4,318,176, Cl. 364-469.000.

Davis, Robert E., to R. E. Davis Chemical Corporation. Methods for detection of roof leaks and areas or zones of the leakage. 4,317,996, Cl. 250-302.000.

Davis, Steven J., to United States of America, Air Force. Optically pumped atomic iodine laser. 4,318,060, Cl. 372-70.000.

Dawson, John H., to Marconi Company Limited, The. Detection of narrow pulses. 4,318,047, Cl. 328-112.000.

de Bont, Marinus R. J.: *See*—
Kivits, Petrus J.; de Bont, Marinus R. J.; and de Poorter, Adriaan W., 4,318,112, Cl. 346-135.100.

DeCastro, Rene F.: *See*—
Timphony, Harold R.; and DeCastro, Rene F., 4,317,301, Cl. 38-102.000.

Dechelette, Helen, to AMP Incorporated. Slotted pate terminal for stranded wire. 4,317,608, Cl. 339-99.00R.

Decker, Raymond E.: *See*—
Swain, Fredrick O.; and Decker, Raymond E., 4,317,528, Cl. 220-224.000.

de Cointet de Fillain, Paul: *See*—
Pigerol, Charles; Chandavoine, Marie-Madeleine; and de Cointet de Fillain, Paul, 4,317,768, Cl. 524-99.000.

Deere & Company: *See*—
Anderson, Sidney E., 4,317,599, Cl. 308-187.000.
Bening, Curtis R., 4,317,500, Cl. 180-273.000.
Funk, Francis C., 4,317,299, Cl. 37-141.00T.
Lemmon, Norman F., 4,317,596, Cl. 301-1.000.
Miller, Wayne R., 4,317,499, Cl. 180-133.000.
Riedinger, Franz W., 4,317,326, Cl. 56-14.600.
Steinbach, James G., 4,317,489, Cl. 172-400.000.

Degeneff, Robert C.; and Kennedy, William N., to General Electric Company. Externally shielded disk windings for transformers. 4,318,066, Cl. 336-70.000.

Degenhardt, Heinz, to Siemens Aktiengesellschaft. Luminescent materials with increased humidity stability. 4,318,001, Cl. 250-483.000.

Degischer, Gerhard; and Angst, Werner, to Ciba-Geigy Corporation. Process for producing N-substituted-N-acetyl-2,6-dialkyl-anilines. 4,317,916, Cl. 560-43.000.

Degussa Aktiengesellschaft: *See*—
Voigt, Carl; Strack, Hans; and Kleinschmit, Peter, 4,317,808, Cl. 423-375.000.

Delta t Limited: *See*—
Geppelt, Elmo W.; and Poore, William H., 4,317,353, Cl. 72-299.000.

Denis, Jean-Hughes: *See*—
Denis, Jean-Pierre, 4,317,483, Cl. 165-81.000.

Denis, Jean-Pierre, to Denis, Jean-Hughes. Heat exchanger. 4,317,483, Cl. 165-81.000.

Denk, Eddie W.: *See*—
Milberger, Lionel J.; Denk, Eddie W.; and Hostrup, Kai R., 4,317,490, Cl. 175-20.000.

De Paoli, Albano: *See*—
Finkbeiner, Ludwig; and De Paoli, Albano, 4,317,559, Cl. 251-331.000.

de Poorter, Adriaan W.: *See*—
Kivits, Petrus J.; de Bont, Marinus R. J.; and de Poorter, Adriaan W., 4,318,112, Cl. 346-135.100.

DePuy, Robert P., to General Electric Company. Fast relay turn on circuit with low holding current. 4,318,154, Cl. 361-155.000.

Derrick, Bruce I. C.; and Geaslin, Jack B., to Agribusiness Enterprises Limited. Method and apparatus for plant cultivation. 4,317,308, Cl. 47-1.100.

De Vincentiis, Leonardo, to Ausonia Farmaceutici S.r.l. Derivatives of methyl-substituted or methoxy-substituted 2-hydroxybenzoic acids, and pharmaceutical formulations containing them. 4,317,917, Cl. 560-72.000.

De Vries, Paul; Gewitz, Steven; and Heyman, Roald G. Fault isolation device. 4,317,967, Cl. 179-175.30R.

Dianitsch, Franz: *See*—
Angerman, GottFried; Armbrust, Otto; Dianitsch, Franz; and Hiebl, Berthold, 4,317,240, Cl. 2-436.000.

Di Battista, Piero; and Gratani, Francesco, to Montedison S.p.A. Stabilizers for polymers and polymers stabilized thereby. 4,317,767, Cl. 524-102.000.

Dickerson, Robert B., to Container Corporation of America. Two-piece container. 4,317,536, Cl. 229-34.00R.

Dickey, Joe B., Jr.; Kuharic, Ivan F.; and Lindahl, Paul A., Jr., to Marley Company, The. Water cooling tower having combination splash and film fill structure. 4,317,785, Cl. 261-111.000.

Dickinson, Harry D. Motorized tire barrier and signal barrier trafficway controller. 4,318,079, Cl. 340-127.000.

Diesel Kiki Co., Ltd.: *See*—
Hatsuno, Hiroshi; and Okada, Yoshimaro, 4,317,355, Cl. 72-342.000.

Dietrich, Arthur G., III. Turbine skid base. 4,317,556, Cl. 248-602.000.

Director-General of Agency of Industrial Science and Technology: *See*—
Ichijo, Michio, 4,317,804, Cl. 423-139.000.

Director, Technical Research and Development Institute, Japan Defence Agency: *See*—
Katsuta, Takeshi; Ikeda, Yoshiyuki; and Inoue, Atsuo, 4,317,691, Cl. 149-2.000.

Dirk-Hazen, William C.: *See*—
Lonseth, Wayne F.; and Dirk-Hazen, William C., 4,318,031, Cl. 315-133.000.

Disharoon, Dale R. Method and apparatus for microtomy. 4,317,401, Cl. 83-856.000.

Djedjeva, Galina M.: *See*—
Popov, Mitko S.; Djedjeva, Galina M.; Todorov, Ivan O.; and Stoeva, Nelly S., 4,317,883, Cl. 435-234.000.

Dobkin, Robert C.: *See*—
Frankel, Denes E.; Dobkin, Robert C.; and Broome, Barry G., 4,318,089, Cl. 340-567.000.

Dr. Ing. Rudolf Hell GmbH: *See*—
Taudt, Heinz; Grieger, Dieter; and Beisswenger, Siegfried, 4,317,982, Cl. 219-121.0EN.

Dr. Johannes Heidenhain GmbH: *See*—
Haering, Thomas, 4,317,876, Cl. 430-293.000.

Doering, Charles W., to Brinly-Hardy Co., Inc. Pushed dethatching unit. 4,317,327, Cl. 56-396.000.

Dohrmann, Rolf; Henke, Ulrich; and Marusiak, Wojciech, to Pierburg GmbH & Co. KG. Spring biased actuator for a thermal delay valve or switch. 4,318,070, Cl. 337-3.000.

Dollar, Delmar L. Air filter including a vortex device. 4,317,663, Cl. 55-413.000.

Domtar Inc.: *See*—
Lapointe, Joseph A., 4,317,544, Cl. 241-57.000.

Dooley, Thomas E.; and Morton, Edward W., to Westinghouse Electric Corp. Fluorescent lamp conversion unit. 4,318,160, Cl. 362-216.000.

Dore, Marcus J., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Infra-red line-scanning target detectors. 4,317,998, Cl. 250-347.000.

Doudet, Michel, to Secim. Cutting devices for extrusion presses. 4,317,352, Cl. 72-255.000.

Dow Chemical Company, The: *See*—
Anderson, Leo J., 4,317,362, Cl. 73-37.000.
Crowe, Curtis W., 4,317,735, Cl. 252-8.55C.
Griffith, Jeffrey D.; and Ozretich, Thomas M., 4,317,672, Cl. 71-27.000.
Harris, Monty E., 4,317,486, Cl. 166-250.000.
Hsieh, Hsin H., 4,317,745, Cl. 252-428.000.
McIntyre, James A.; and Phillips, Robert F., 4,317,704, Cl. 204-1.00R.

Down, Michael G., to Westinghouse Electric Corp. Production of hydrogen, acetylene and ammonia gases from lithium reaction with hydrocarbon materials. 4,317,659, Cl. 48-209.000.

Doyle, John R. Fireplace heating unit. 4,317,442, Cl. 126-121.000.

Dozier, Harold W., to Mostek Corporation. Method for making a depletion controlled switch. 4,317,275, Cl. 29-571.000.

Dragerwerk Aktiengesellschaft: *See*—
Heim, Ulrich; and Kempin, Hans-Friedhelm, 4,317,453, Cl. 128-719.000.

Dresser Industries, Inc.: *See*—
Blackwell, Henry W., 4,317,407, Cl. 92-241.000.

Drew Chemical Corporation: *See*—
Levi, Elliott J., 4,317,744, Cl. 252-389.00A.

Drouineau, Michel: *See*—
Martin, Jean-Francois; and Drouineau, Michel, 4,317,269, Cl. 29-157.30R.

Ducruet, Henri: *See*—
Artaud, Claude; and Ducruet, Henri, 4,317,504, Cl. 182-67.000.

Dugua, Jacques, to Metaux Speciaux. Process for separating molybdenum and/or other metals contained in residual organic effluents. 4,317,802, Cl. 423-55.000.

Dumas, David H., to Hercules Incorporated. Sizing composition comprising a hydrophobic cellulose-reactive sizing agent and a cationic polymer. 4,317,756, Cl. 524-607.000.

Duphar International Research B.V.: *See*—
van Dijk, Jan; and Zwagemakers, Johannes M. A., 4,317,835, Cl. 424-309.000.

Du Pont de Nemours, E. I., and Company: *See*—
Sheer, M. Lana, 4,317,764, Cl. 524-449.000.

Dupont, Jean-Marie: *See*—
Castera, Jean-Paul; and Dupont, Jean-Marie, 4,318,061, Cl. 331-107.00A.

Durant, Graham J.; Emmett, John C.; Ganellin, Charon R.; and Prain, Hunter D., to Smith Kline & French Laboratories Limited. Triazole-substituted ethylene derivatives. 4,317,829, Cl. 424-269.000.

Dussault, Richard A.: *See*—
Lombardo, Igino; and Dussault, Richard A., 4,317,520, Cl. 209-3.100.

Dykast, Jaroslay: *See*—
Burysek, Frantisek; and Dykast, Jaroslay, 4,317,545, Cl. 242-18.00A.

Dynamit Nobel AG: *See*—
Huthwelker, Dirk; Franz, Arnold; and Kopnick, Siegfried, 4,317,856, Cl. 428-273.000.

Dynapac Maskin AB: *See*—
Carlstrom, Per; and Persson, Gert, 4,317,314, Cl. 51-177.000.

Dyskievicz, Steve M.: *See*—
Stratton, Larry J.; Norini, Richard A.; Davis, Peter G.; Dyskievicz, Steve M.; Cowap, Frederic W.; Haskin, Roger L.; Gagner, Mark B.; and Mynett, Thomas M., 4,318,176, Cl. 364-469.000.

E. R. Squibb & Sons, Inc.: *See*—
Haslanger, Martin F., 4,317,906, Cl. 542-426.000.
Hauck, Frederic P.; and Reid, Joyce, 4,317,910, Cl. 544-154.000.
Hoehn, Hans, 4,317,831, Cl. 424-273.00R.

E-Systems, Inc.: *See*—
Smith, Robert R.; and Tippit, Guy H., 4,317,279, Cl. 30-90.100.

Eames, Frederick M., Jr., to Harris Data Communications, Inc. Dynamic focusing circuit for a cathode ray tube. 4,318,033, Cl. 315-382.000.

Eastman Kodak Company: *See*—
Abel, Edward P., 4,317,892, Cl. 525-194.000.
Metzger, Lenard M., 4,317,622, Cl. 354-34.000.
Poshkus, Gerald M., 4,317,626, Cl. 354-180.000.

Ebner, Walter; Kramis, Werner; and Studer, Gustav, to Contraves AG. Apparatus for supporting a weapon system upon a combat vehicle. 4,317,405, Cl. 89-37.00G.

Eckert, Kim: *See*—
Thomas, James S.; and Eckert, Kim, 4,318,013, Cl. 307-362.000.

Eckstein, Udo; and Siegel, Edgar, to Bayer Aktiengesellschaft. Distyryl compounds. 4,317,782, Cl. 260-932.000.

Eda, Tadahiro; Tatsumi, Susumu; and Imai, Chikara, to Ricoh Company, Ltd. Electrometer probe. 4,318,042, Cl. 324-72.500.

Egert, Allen C., to Victor Equipment Co. Flowmeter with pressure release. 4,317,375, Cl. 73-861.550.

Eguchi, Seiji: *See*—
Suzuki, Seigo; and Eguchi, Seiji, 4,318,174, Cl. 364-200.000.

Ehashi, Shigeyuki: *See*—
Katsura, Hiromitsu; Ehashi, Shigeyuki; Tsuchida, Junichi; and Kakimoto, Kenichi, 4,317,682, Cl. 106-288.00B.

Einarsson, Stefan: *See*—
Soderquist, Jan; and Einarsson, Stefan, 4,317,503, Cl. 181-290.000.

Eisai Co., Ltd.: *See*—
Hirose, Noriyasu; and Souda, Shigeru, 4,317,930, Cl. 564-363.000.

Eisenhard, Wilmer C., to Union Camp Corporation. Water-soluble polyesters. 4,317,740, Cl. 252-49.300.

El-Amin, Nu'man W. Water bed sheet. 4,317,245, Cl. 5-497.000.

Elba-Werk Maschinen-Gesellschaft mbH & Co.: *See*—
Rapp, Joachim; and Bittmann, Peter, 4,318,177, Cl. 364-502.000.

Electric Power Research Institute, Inc.: *See*—
Orphan, Victor J.; and Ginaven, Robert O., 4,317,632, Cl. 356-241.000.

ElectroPrint, Inc.: *See*—
Pressman, Gerald L.; and Gardiner, Kenneth W., 4,318,002, Cl. 250-492.200.

Eley, Edgar R., to Westinghouse Electric Corp. Protected electrical inductive apparatus. 4,318,150, Cl. 361-41.000.

Elfick, Michael H.; and Fletcher, Michael J., to University of Newcastle Research Associates Ltd., The. Photogrammetric apparatus. 4,317,286, Cl. 33-1.00A.

El-Hag, Nabil A.; and Shanbhag, Sudhakar P., to General Foods Corporation. Preparing frozen par-fried potato strips. 4,317,842, Cl. 426-302.000.

Elliott, Michael T.: *See*—
Tanaka, Kunihide; Elliott, Michael T.; Chung, Sam; Pau, James; Gray, Linda; Hou, Liping D.; F'Mayer, Mary; Warren, David; and Finch, Karen, 4,317,700, Cl. 156-652.000.

Elsner, Emil: *See*—
Weber, Ralph; Elsner, Emil; Maschlanka, Walter; Rollinger, Bernt; and Sanders, Gerhard, 4,317,677, Cl. 75-43.000.

Emelyanov, Alexandr N.: *See*—
Chubarov, Evgeny P.; Kubyshkin, Viktor A.; Mitrofanov, Vladimir E.; Emelyanov, Alexandr N.; Butkovsky, Anatoly G.; Norkin, Kemer B.; Aizenshtein, Anatoly G.; Kolomeitseva, Margarita B.; Suvorov, Arthur M.; and Vazhnov, Sergei A., 4,317,981, Cl. 219-121.0EA.

Emerson Electric Co.: *See*—
Fitzpatrick, H. Paul, 4,317,376, Cl. 73-861.550.

Emery Industries, Inc.: *See*—
Torok, John; McCaffrey, Eugene F.; Riem, Roland H.; and Cheung, Wing S., 4,317,748, Cl. 252-472.000.

Emhart Industries, Inc.: *See*—
Scott, Charles E.; Smith, Robert L.; and Bristol, Robert G., 4,318,084, Cl. 340-309.100.

Emmerling, Robert C., to Garrett Corporation, The. Cooling system. 4,317,439, Cl. 123-563.000.

Emmett, John C.: *See*—
Durant, Graham J.; Emmett, John C.; Ganellin, Charon R.; and Prain, Hunter D., 4,317,829, Cl. 424-269.000.

Emrich, Robert K.; Prather, William H.; and Burkhart, John M., to ESCO Corporation. Earth working tooth with wear cap. 4,317,300, Cl. 37-142.00R.

Enein, Mohamed H., to Plessey Handel und Investments AG. Directional arrays. 4,318,104, Cl. 343-100.0LE.

Engel, A. Richard. Animal carrying and skinning device. 4,317,257, Cl. 17-21.000.

Engineering Components Limited: *See—*
Barker, Clinton B.; and Wright, Martin E. J., 4,317,576, Cl. 277-235.00B.

Englund, Roland; and Wincent, Tommy, to Svenska Kassaprinter AB. Matrix printing head. 4,317,635, Cl. 400-124.000.

Ensign, Thomas C.: *See—*
Cowles, Arthur L.; and Ensign, Thomas C., 4,318,092, Cl. 340-636.000.

Entwistle Company, The: *See—*
Allard, Joseph R., 4,317,328, Cl. 57-59.000.

Eppler, Richard A., to Mobay Chemical Corporation. Orange pigments of inverse spinel structure produced by co-calcination of compounds of iron and zinc with compounds of titanium, tin and/or silicon. 4,317,683, Cl. 106-292.000.

Epstein, Harold M.: *See—*
Mallozzi, Philip J.; Epstein, Harold M.; Schwerzel, Robert E.; and Campbell, Bernerd E., 4,317,994, Cl. 250-275.000.

Erwin Sick GmbH Optik-Elektronik: *See—*
Hafner, Manfred; and Hunold, Heinz, 4,317,970, Cl. 200-61.430.

ESCO Corporation: *See—*
Emrich, Robert K.; Prather, William H.; and Burkhart, John M., 4,317,300, Cl. 37-142.00R.

Esmil B.V.: *See—*
Sloterdijk, Wijtze; Dapper, Gerrit; Verbraak, Cornelis A.; and Kirchner, Willem, 4,317,800, Cl. 423-1.000.

ESPE Fabrik Pharmazeurischer Preparate GmbH: *See—*
Herold, Wolf-Dietrich, 4,317,615, Cl. 350-96.320.

Esquire, Inc.: *See—*
Lonseth, Wayne F.; and Dirk-Hazen, William C., 4,318,031, Cl. 315-133.000.

Ess, Wilfried, to Schelling & Co. System for the staggered division of planar workpieces. 4,317,397, Cl. 83-35.000.

Ethicon, Inc.: *See—*
Cerwin, Robert J.; and McVay, William P., 4,317,451, Cl. 128-325.000.

Ethyl Corporation: *See—*
Niebylski, Leonard M., 4,317,657, Cl. 44-66.000.
Raley, Garland E.; and Adams, James M., 4,317,792, Cl. 264-504.000.
Seemuth, Paul D., 4,317,934, Cl. 568-437.000.
Wollensak, John C.; Ihrman, Kryn G.; and Jarema, Chester P., 4,317,931, Cl. 564-409.000.

Ettlinger, Louis F.: *See—*
Bennett, Moreland P.; and Ettlinger, Louis F., 4,317,277, Cl. 29-860.000.

Evana Tool & Engineering Company: *See—*
Fuchs, Gilbert; Crowley, Norman; and Wink, Randall, 4,317,694, Cl. 156-256.000.

Evans, E. Robert: *See—*
Bluestein, Ben A.; and Evans, E. Robert, 4,317,899, Cl. 528-14.000.

Expert N.V.: *See—*
Weststrate, Marinus H.; and Willemsen, Jan, 4,317,291, Cl. 34-103.000.

Exxon Production Research Company: *See—*
Krause, Kenneth E., 4,317,496, Cl. 177-163.000.
Orr, Willis P., 4,317,557, Cl. 251-1.00B.

Exxon Research & Engineering Co.: *See—*
Oswald, Alexis A.; Harting, Gary L.; and Barnum, Harry W., 4,317,737, Cl. 252-28.000.
Worley, Arthur C., 4,317,798, Cl. 422-144.000.

Faigley, Charles W., Jr., to Timken Company, The. Polymer cage for a tapered roller bearing. 4,317,601, Cl. 308-202.000.

Falzoni, Gianluigi, to Fiat Auto S.p.A. Vehicle drive transmission system. 4,317,389, Cl. 74-689.000.

Farcasiu, Malvina, to Mobil Oil Corporation. Conversion of heavy petroleum oils. 4,317,712, Cl. 208-46.000.

Farmitalia Carlo Erba S.p.A.: *See—*
Temperilli, Aldemio; Mantegani, Sergio; Arcari, Giuliana; and Caravaggi, Anna M., 4,317,912, Cl. 546-199.000.

Farrington, Lawrence A.: *See—*
Partridge, Malcolm F.; Simpkins, Frederick W.; and Farrington, Lawrence A., 4,318,134, Cl. 358-287.000.

Fasano, Michael, to Porta Systems Corp. Sneak current fuse for telephone circuits. 4,318,153, Cl. 361-119.000.

Faulring, Gloria M.; and Hilty, Donald C., to Union Carbide Corporation. Process for continuous casting of aluminum-deoxidized steel. 4,317,678, Cl. 75-58.000.

Faure, Michel; and Lumineau, Yves, to Thomson-CSF. Process and apparatus for controlling the drawing of an optical fibre from a glass preform. 4,317,666, Cl. 65-2.000.

Faxon, Merle W., to Raytheon Company. Over stress sense circuit for flyback power supply. 4,318,168, Cl. 363-56.000.

Feeley, John M.: *See—*
Feeley, Ruth E.; and Feeley, John M., 4,317,515, Cl. 206-315.00R.

Feeley, Ruth E.; and Feeley, John M. Game package. 4,317,515, Cl. 206-315.00R.

Feldman, Steven: *See—*
Rossler, Frederick W., Jr.; and Feldman, Steven, 4,318,073, Cl. 338-28.000.

Feldstein, Nathan. Dispersions for activating non-conductors for electroless plating. 4,317,846, Cl. 427-98.000.

Ferrari, Leonard A.: *See—*
Taite, Jason; and Ferrari, Leonard A., 4,318,121, Cl. 358-22.000.

Ferrigno, William L., Jr., to General Electric Company. Interface device for remote control. 4,318,094, Cl. 340-657.000.

Ferro Corporation: *See—*
Provance, Jason D.; and Allison, Kevin W., 4,317,749, Cl. 252-519.000.
Provance, Jason D.; and Allison, Kevin W., 4,317,750, Cl. 252-519.000.

Fiat Auto S.p.A.: *See—*
Falzoni, Gianluigi, 4,317,389, Cl. 74-689.000.

Fiber Tech, Inc.: *See—*
Tisdale, Lucien E., 4,317,517, Cl. 206-597.000.

Fiedler, Helmut. Programmable switching device. 4,318,185, Cl. 364-900.000.

Fieldman, Dan I. Remote control device for a water heater. 4,317,987, Cl. 219-506.000.

Finch, Karen: *See—*
Tanaka, Kunihide; Elliott, Michael T.; Chung, Sam; Pau, James; Gray, Linda; Hou, Liping D.; F'Mayer, Mary; Warren, David; and Finch, Karen, 4,317,700, Cl. 156-652.000.

Finkbeiner, Ludwig; and De Paoli, Albano, to Robert Bosch GmbH. Membrane for a valve and methods of fabricating a membrane. 4,317,559, Cl. 251-331.000.

Firestone Tire & Rubber Company, The: *See—*
McDonald, Peter, 4,317,479, Cl. 152-353.00R.

Firmin, Herman P., to Knight Manufacturing Company, Inc. Artificial lure. 4,317,305, Cl. 43-42.240.

Fisher & Paykel Limited: *See—*
Borrows, John G., 4,317,351, Cl. 72-186.000.

Fisons Limited: *See—*
Sullivan, Thomas J., 4,317,833, Cl. 424-283.000.

Fitz, Frank A.: *See—*
Majicek, Stepan; and Fitz, Frank A., 4,317,722, Cl. 210-149.000.

Fitzgerald, William V., to RCA Corporation. Side pincushion correction circuit. 4,318,035, Cl. 315-387.000.

Fitzpatrick, H. Paul, to Emerson Electric Co. Flowmeter with one-piece body. 4,317,376, Cl. 73-861.550.

Fjeldstad, Jarle: *See—*
Strandli, Kare R.; Middleton, Thomas; and Fjeldstad, Jarle, 4,317,413, Cl. 102-275.900.

Fladda, Gerdt H.: *See—*
Lundqvist, Inge J.; Pettersson, Jan G. T.; and Fladda, Gerdt H., 4,318,180, Cl. 364-555.000.

Fleck Industries, Inc.: *See—*
Graham, Andrew S., Jr.; and Berg, Coleman D., 4,317,547, Cl. 242-55.300.

Flegal, Robert M.: *See—*
Thornburg, David D.; Flegal, Robert M.; and Lam, Tat C., 4,318,096, Cl. 340-706.000.

Fletcher, Michael J.: *See—*
Elfick, Michael H.; and Fletcher, Michael J., 4,317,286, Cl. 33-1.00A.

F'Mayer, Mary: *See—*
Tanaka, Kunihide; Elliott, Michael T.; Chung, Sam; Pau, James; Gray, Linda; Hou, Liping D.; F'Mayer, Mary; Warren, David; and Finch, Karen, 4,317,700, Cl. 156-652.000.

FMC Corporation: *See—*
Roberts, Thomas E., Jr.; Abbott, John A.; and Wright, Bruce M., 4,317,731, Cl. 210-741.000.
Williams, Michael R., 4,317,408, Cl. 92-241.000.

Fohl, Artur, to Repa Feinstanzwerk GmbH. Belt lock for a safety belt. 4,317,263, Cl. 24-230.0AT.

Folley, Robert F.: *See—*
Miller, Cardell E.; Folley, Robert F.; and Larson, Ralph H., 4,317,475, Cl. 141-95.000.

Folus, Stanford G., to Catalyst Research Corporation. Battery structure. 4,317,869, Cl. 429-128.000.

Ford Motor Company: *See—*
Gerlock, John L.; Braslaw, Jacob; and Albright, Jane, 4,317,939, Cl. 568-121.000.
Livermore, Malcolm J.; and Hobbs, John C., 4,318,158, Cl. 362-29.000.

Foresto, Samuel. Incinerator apparatus and method of utilizing the cleaned waste gases thereof. 4,317,417, Cl. 110-211.000.

Formica Corporation: *See—*
Cosway, Harry F., 4,317,901, Cl. 528-139.000.

Formiconi, Lamberto: *See—*
Zaffaroni, Pasquale; Senni, Antonio; and Formiconi, Lamberto, 4,317,884, Cl. 435-247.000.

Forrest, James T.; and Thornton, Robert L., to Seabrook Blanching Corporation of Georgia. Rotary peanut and blanching apparatus. 4,317,411, Cl. 99-623.000.

Forslund, Sven E., to AZ Sellbergs AB. Method and apparatus for dividing a mixture of pieces or fragments of different materials and having different sizes into two or more fractions. 4,317,714, Cl. 209-44.000.

Four Seazons Window Corporation: *See—*
Heideman, Robert J., 4,317,312, Cl. 49-220.000.

Four Stars Jewelry Corp.: *See—*
Bogner, Max; and Grun, Larry, 4,317,264, Cl. 29-8.000.

Frandsen, Jorgen. to Burroughs Corporation. Multiple-transducer/actuator array. 4,318,145, Cl. 360-106.000.

Frank, William E.; and Billman, Erwin A., to Westinghouse Electric Corp. High current high frequency current transformer. 4,317,979, Cl. 219-10.770.

Frankel, David: *See—*
Frankel, Denes E.; Dobkin, Robert C.; and Broome, Barry G., 4,318,089, Cl. 340-567.000.

Frankel, Denes E.; Dobkin, Robert C.; and Broome, Barry G., to Frankel, David. Infrared detector system. 4,318,089, Cl. 340-567.000.
Franz, Arnold: *See*—
Huthwelker, Dirk; Franz, Arnold; and Kopnick, Siegfried, 4,317,856, Cl. 428-273.000.
Franzmann, Rainer. Device for continuous pitch variation of stringed instruments. 4,317,403, Cl. 84-313.000.
Fredericks, George E., to AVL AG. Circuit arrangement for an electro-chemical measuring device. 4,318,041, Cl. 324-71.00R.
Freedman, Morris D.; Whiteside, Arliss E.; and Rothschild, Alexander M., to Bendix Corporation, The. Scheduler for a multiple computer system. 4,318,173, Cl. 364-200.000.
Fridlyand, Mikhail G. Method of plasma treatment of materials. 4,317,984, Cl. 219-121.0PU.
Friedli, Hans: *See*—
Gut, Edwin; Arnold, Erwin; and Friedli, Hans, 4,317,595, Cl. 299-94.000.
Friello, Dominick R.: *See*—
Cherukuri, Subraman R.; and Friello, Dominick R., 4,317,838, Cl. 426-5.000.
Kehoe, Gary; Puglia, Wayne J.; Witzel, Frank; Friello, Dominick R.; and Mackay, Donald A. M., 4,317,837, Cl. 426-3.000.
Froscher, Peter; and Schulze, Joachim, to Siemens Aktiengesellschaft. Method and apparatus for measuring attenuation in light waveguides for communications transmission purposes. 4,317,631, Cl. 356-73.100.
Fuchs, Gilbert; Crowley, Norman; and Wink, Randall, to Evana Tool & Engineering Company. Laminate applying machine and method. 4,317,694, Cl. 156-256.000.
Fuchs, Rainer; Naumann, Klaus; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. Combating arthropods with fluorine-substituted spirocarboxylic acid benzyl esters. 4,317,834, Cl. 424-304.000.
Fuel Lock Systems: *See*—
Hinson, Lee R., 4,317,345, Cl. 70-170.000.
Fuhrmann, Wolfgang, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Flat-faced tappets for valve trains. 4,317,433, Cl. 123-90.510.
Fuji Photo Film Co., Ltd.: *See*—
Murakoshi, Makoto, 4,317,618, Cl. 350-120.000.
Fujibayashi, Kenji: *See*—
Shibata, Tutomu; Osanai, Akira; Tomabechi, Hideo; and Fujibayashi, Kenji, 4,318,139, Cl. 360-71.000.
Fujii, Takashi: *See*—
Katagiri, Masayoshi; and Fujii, Takashi, 4,317,508, Cl. 188-218.00A.
Fujimori, Ryo: *See*—
Suzuki, Hideo; and Fujimori, Ryo, 4,317,710, Cl. 204-299.00R.
Fujimori, Yoshitsugu: *See*—
Kume, Tadashi; Fujimori, Yoshitsugu; and Inoh, Isamu, 4,317,725, Cl. 210-235.000.
Fukuda, Daiki: *See*—
Morishita, Teru; and Fukuda, Daiki, 4,317,542, Cl. 239-585.000.
Fukuda, Shin; and Hirashima, Masayoshi, to Matsushita Electric Industrial Co., Ltd. Multiplexed television signal processing system. 4,318,127, Cl. 358-147.000.
Fukui, Toshiyasu: *See*—
Tanabe, Zenichi; Fukui, Toshiyasu; Ikeda, Hiroshi; Miura, Tatsuo; and Sugiura, Taketoshi, 4,317,484, Cl. 165-134.00R.
Fukuoka, Kenji, to Olympus Optical Co. Ltd. Digital input apparatus. 4,318,095, Cl. 340-706.000.
Fukuura, Yukio: *See*—
Honda, Toshio; Tanuma, Itsuo; Ogawa, Masao; Ishikawa, Hikaru; Fukuura, Yukio; Akiyama, Setsuo; Ojima, Shozo; and Naito, Kazuo, 4,317,862, Cl. 428-442.000.
Fulmer, Keith H., to Bendix Corporation, The. Self-resetting warning actuator for a dual circuit brake system. 4,318,091, Cl. 340-626.000.
Funk, Francis C., to Deere & Company. Tooth arrangement for earthworking implement. 4,317,299, Cl. 37-141.00T.
Funk, Gary L.: *See*—
Stewart, William S.; Funk, Gary L.; and Huang, Warren H., 4,318,178, Cl. 364-502.000.
Funke, Werner: *See*—
Oberlander, Gerhard; Muller, Reinhard; and Funke, Werner, 4,317,379, Cl. 73-863.120.
Gabriel, Naeem B. Bike for travelling over water. 4,317,422, Cl. 114-270.000.
GAF Corporation: *See*—
Cavicchio, Ernest A., 4,317,575, Cl. 277-227.000.
Gagner, Mark B.: *See*—
Stratton, Larry J.; Norini, Richard A.; Davis, Peter G.; Dyskievicz, Steve M.; Cowap, Frederic W.; Haskin, Roger L.; Gagner, Mark B.; and Mynett, Thomas M., 4,318,176, Cl. 364-469.000.
Galasan, Felixberto A.; Watson, Thomas H.; and Barkhimer, Robert L., to Pullman Incorporated. Railway car end doors. 4,317,415, Cl. 105-378.000.
Gallagher, Michael J. Portable distribution box. 4,318,156, Cl. 361-358.000.
Gallaher Limited: *See*—
Dale, Robert W.; and Rooney, John J., 4,317,460, Cl. 131-334.000.
Galvagni, Alighiero, to Ing. C. Olivetti & C., S.p.A. Flexible magnetic disk recording apparatus. 4,318,144, Cl. 360-99.000.
Ganellin, Charon R.: *See*—
Durant, Graham J.; Emmett, John C.; Ganellin, Charon R.; and Prain, Hunter D., 4,317,829, Cl. 424-269.000.
Gardiner, Kenneth W.: *See*—
Pressman, Gerald L.; and Gardiner, Kenneth W., 4,318,002, Cl. 250-492.200.
Garrett Corporation, The: *See*—
Emmerling, Robert C., 4,317,439, Cl. 123-563.000.
Garrett, June P. Suspended plate display system. 4,317,522, Cl. 211-113.000.
Gates, Douglas R.: *See*—
Barnhart, David E.; and Gates, Douglas R., 4,317,436, Cl. 123-188.00P.
Gausman, James W.: *See*—
Willenbring, Armer J.; Osby, Warren J.; and Gausman, James W., 4,317,564, Cl. 271-223.000.
Gautier, Francois: *See*—
Pierrot, Robert; Gautier, Francois; and Crochet, Pierre, 4,318,107, Cl. 343-700.0MS.
Gaydos, Joseph A., to Becton, Dickinson and Company. Fluid flow control assembly. 4,317,473, Cl. 138-45.000.
Gaylord, Norman G., to Champion International Corporation. Compatibilization of hydroxyl-containing fillers and thermoplastic polymers. 4,317,765, Cl. 523-204.000.
Geaslin, Jack B.: *See*—
Derrick, Bruce I. C.; and Geaslin, Jack B., 4,317,308, Cl. 47-1.100.
General Atomic Company: *See*—
Hurley, George L., III; and Krystek, Michael S., 4,318,010, Cl. 307-261.000.
General Dynamics, Pomona Division: *See*—
Palmer, John P., 4,317,614, Cl. 350-96.160.
General Electric Company: *See*—
Abolins, Visvaldis, 4,317,761, Cl. 524-141.000.
Ahuja, Pritam L.; and Borom, Marcus P., 4,317,685, Cl. 134-2.000.
Armor, Anthony F.; Archibald, James B.; and Noel, David A., 4,317,952, Cl. 174-15.0BH.
Bennett, Moreland P.; and Ettlinger, Louis F., 4,317,277, Cl. 29-860.000.
Bluestein, Ben A.; and Evans, E. Robert, 4,317,899, Cl. 528-14.000.
Davis, Gary C., 4,317,944, Cl. 568-728.000.
Degeneff, Robert C.; and Kennedy, William N., 4,318,066, Cl. 336-70.000.
DePuy, Robert P., 4,318,154, Cl. 361-155.000.
Ferrigno, William L., Jr., 4,318,094, Cl. 340-657.000.
Gerry, Otto F., 4,317,343, Cl. 68-23.700.
Kornrumpf, William P.; Park, John N.; and Chen, De Y., 4,318,165, Cl. 363-21.000.
Kure-Jensen, Jens; and Missana, Adrian, 4,318,179, Cl. 364-506.000.
Miller, Sammy L., 4,318,022, Cl. 310-260.000.
Palmer-Ball, Marion H., Sr., 4,317,516, Cl. 206-320.000.
Shanks, Bruce E., 4,318,161, Cl. 362-226.000.
Sip, Jiri G., 4,318,162, Cl. 362-226.000.
Wolfinger, John F., 4,317,371, Cl. 73-650.000.
Wood, Robert J.; and Mitchell, John F., 4,318,093, Cl. 340-644.000.
General Foods Corporation: *See*—
El-Hag, Nabil A.; and Shanbhag, Sudhakar P., 4,317,842, Cl. 426-302.000.
Mitchell, William A.; Wasserman, Gerald S.; and Glatz, Alfred C., 4,317,839, Cl. 426-96.000.
General Motors Corporation: *See*—
Alt, Robert D.; Richardson, James H.; and Williams, Alverson B., 4,317,497, Cl. 180-68.500.
Armstrong, John T., 4,317,266, Cl. 29-148.40A.
Barnhart, David E.; and Gates, Douglas R., 4,317,436, Cl. 123-188.00P.
Beardmore, John M., 4,317,541, Cl. 239-88.000.
Lindgren, Timothy F., 4,317,437, Cl. 123-414.000.
Myers, Ronald I.; and Rader, Charles W., 4,317,387, Cl. 74-493.000.
Ramsey, Eugene P., 4,317,591, Cl. 297-455.000.
Schubert, Malvin L., 4,317,332, Cl. 60-547.00R.
Staub, Vincent M., Jr., 4,317,510, Cl. 192-48.300.
Thomas, Steven L., 4,318,155, Cl. 361-156.000.
Wheten, Charles E., 4,317,426, Cl. 118-418.000.
Georg, Otto. Screw press. 4,317,359, Cl. 72-454.000.
Geppelt, Elmo W.; and Poore, William H., to Delta t Limited. Tube twisting apparatus. 4,317,353, Cl. 72-299.000.
Gerlock, John L.; Braslaw, Jacob; and Albright, Jane, to Ford Motor Company. Catalyzed dissolution-hydrolysis of polyurethane wastes. 4,317,939, Cl. 568-121.000.
Gerry, Otto F., to General Electric Company. Drive arrangement for a washing machine. 4,317,343, Cl. 68-23.700.
Gewerkschaft Eisenhutte Westfalia: *See*—
Unger, Eberhart, 4,317,594, Cl. 299-64.000.
Gewitz, Steven: *See*—
De Vries, Paul; Gewitz, Steven; and Heyman, Roald G., 4,317,967, Cl. 179-175.30R.
Giammarra, John R. Electrical boxes and accessory therefore. 4,317,954, Cl. 174-53.000.
Gielly, Jean-Francois; Lizee, Dominique; and Sohier, Bernard, to Rhone-Poulenc Industries. Air cooling during the production of phosphoric acid. 4,317,807, Cl. 423-320.000.
Gilligan, William H.: *See*—
Sitzmann, Michael E.; and Gilligan, William H., 4,317,928, Cl. 564-160.000.
Gillotti, Albert L.: *See*—
Joshi, Ashok V.; Gillotti, Albert L.; and Sholette, William P., 4,317,874, Cl. 429-213.000.
Gilman, Byron L., to Medtronic, Inc. Fixation loop for transvenous leads. 4,317,459, Cl. 128-785.000.

Ginaven, Robert O.: *See—*
Orphan, Victor J.; and Ginaven, Robert O., 4,317,632, Cl. 356-241.000.
Glaenzer Spicer: *See—*
Orain, Michel A., 4,317,602, Cl. 308-207.00R.
Glatz, Alfred C.: *See—*
Mitchell, William A.; Wasserman, Gerald S.; and Glatz, Alfred C., 4,317,839, Cl. 426-96.000.
Glaxo Group Limited: *See—*
Clitherow, John W.; Price, Barry J.; Bradshaw, John; and Martin-Smith, Michael, 4,317,819, Cl. 424-244.000.
Gleason, John G., to SmithKline Corporation. N,N'-Bis[substituted-1,2,3,4 tetrahydroisoquinolyl]disulfonylimides and antiallergic compositions and method of use. 4,317,826, Cl. 424-258.000.
Gleize, Jacques, to Compagnine Generale de Geophysique. Apparatus for the production of seismic shocks. 4,317,501, Cl. 181-121.000.
Glenn, William E., to New York Institute of Technology. Ultrasound imaging system. 4,317,370, Cl. 73-620.000.
Goda, Hiroyuki: *See—*
Sakurai, Shubun; and Goda, Hiroyuki, 4,317,637, Cl. 400-240.100.
Goes, Michael J.; and Masly, John R. Fatigue cycle sensor and method. 4,317,373, Cl. 73-787.000.
Golata, John H.; and Kinstler, John R., to Motor Wheel Corporation. Wheel disc and method for manufacture thereof. 4,317,597, Cl. 301-63.00R.
Golota, John H., to Westinghouse Electric Corp. Disconnect switch and drive mechanism therefor. 4,317,973, Cl. 200-153.00P.
Golovko, Vladimir N.: *See—*
Pokhodnya, Igor K.; and Golovko, Vladimir N., 4,317,688, Cl. 148-24.000.
Gomann, Rolf: *See—*
Greve, Heinz; Grumer, Peter; and Gomann, Rolf, 4,317,425, Cl. 118-33.000.
Gomolka, William. Compartmented container. 4,317,607, Cl. 312-236.000.
Gonczy, Csaba: *See—*
Palosi, Endre; Korbonits, Dezso; Kiss, Pal; Gonczy, Csaba; Heja, Gergely; Cser nee Kun, Judit; Szebeni, Rudolf; Szomor nee Wundele, Maria; and Szvoboda nee Kanzel, Ida, 4,317,920, Cl. 562-440.000.
Good, Dallis L.: *See—*
Good, David L.; and Good, Dallis L., 4,317,707, Cl. 204-213.000.
Good, David L.; and Good, Dallis L. Portable electrolysis unit for recovery of silver from photographic film. 4,317,707, Cl. 204-213.000.
Goodrich, Russell A.; Lengerman, Larry H.; and Timbeross, James K., to International Business Machines Corporation. Resistance welding sequence cycle control. 4,317,980, Cl. 219-117.100.
Goodyear, Mark V. Replaceable shoe sole. 4,317,294, Cl. 36-100.000.
Goodyear Tire & Rubber Company, The: *See—*
Parker, Dane K., 4,317,933, Cl. 568-433.000.
Gord, Herbert; and Becker, Reinhold, to Hoechst Aktiengesellschaft. Process for the continuous manufacture of fiber-reinforced cellulose hydrate tubing and equipment for carrying out the processes. 4,317,794, Cl. 264-559.000.
Goto, Shuichi: *See—*
Shimizu, Toshio; Wakabayashi, Atsushi; and Goto, Shuichi, 4,318,100, Cl. 343-5.00W.
Gould Inc.: *See—*
Oellerich, Bruce A., 4,317,870, Cl. 429-161.000.
Spiegelberg, Bernard N., 4,317,868, Cl. 429-82.000.
Varma, Brajendra P., 4,317,872, Cl. 429-190.000.
Wolf, Alby H.; and Strait, Richard T., 4,317,871, Cl. 429-179.000.
Gould, Norman P.: *See—*
Cragoe, Edward J., Jr.; Stokker, Gerald E.; and Gould, Norman P., 4,317,922, Cl. 562-461.000.
Goyert, Wilhelm; Awater, Albert; Grimm, Wolfgang; Ott, Karl-Heinz; Oberkirch, Wolfgang; and Wagner, Hans, to Bayer Aktiengesellschaft. Thermoplastic synthetic material and a process for its production. 4,317,890, Cl. 525-66.000.
Graffam, Kenneth. Extensible torque bar. 4,317,393, Cl. 81-177.00A.
Graham, Andrew S., Jr.; and Berg, Coleman D., to Fleck Industries, Inc. Transfer paper towel dispenser. 4,317,547, Cl. 242-55.300.
Graham, William W. Brush cutting attachment for chain saw. 4,317,285, Cl. 30-371.000.
Gras, Rainer: *See—*
Schnurbusch, Horst; Gras, Rainer; and Wolf, Elmar, 4,317,900, Cl. 528-59.000.
Grasselli, Robert K.: *See—*
Suresh, Dev D.; and Grasselli, Robert K., 4,317,747, Cl. 252-469.000.
Gratani, Francesco: *See—*
Di Battista, Piero; and Gratani, Francesco, 4,317,767, Cl. 524-102.000.
Grawe, Helmut; and Petters, Claus, to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung. Sea-bottom mine. 4,317,414, Cl. 102-406.000.
Gray, Linda: *See—*
Tanaka, Kunihide; Elliott, Michael T.; Chung, Sam; Pau, James; Gray, Linda; Hou, Liping D.; F'Mayer, Mary; Warren, David; and Finch, Karen, 4,317,700, Cl. 156-652.000.
Green, John R. Golf club with reference plumb mark. 4,317,568, Cl. 273-163.00A.
Greene, Richard A.: *See—*
Asar Madhu P.; and Greene, Richard A., 4,317,695, Cl. 156-353.000.
Greer Hydraulics Incorporated: *See—*
Zahid, Abduz, 4,317,472, Cl. 138-30.000.
Gregory, Gordon K., to S. C. Johnson & Son, Inc. Self-polishing sealing composition. 4,317,755, Cl. 524-276.000.
Greiner, William L., III: *See—*
Hutchinson, Robert S.; and Greiner, William L., III, 4,317,696, Cl. 156-523.000.
Greve, Heinz; Grumer, Peter; and Gomann, Rolf, to Hauni-Werke Korber & Co. KG. Apparatus for applying plasticizer to fibrous filter material in filter rod making machines. 4,317,425, Cl. 118-33.000.
Grieger, Dieter: *See—*
Taudt, Heinz; Grieger, Dieter; and Beisswenger, Siegfried, 4,317,982, Cl. 219-121.0EN.
Griffin, T. Scott: *See—*
Klayman, Daniel L.; Scovill, John P.; Bartosevich, Joseph F.; Mason, Carl J.; and Griffin, T. Scott, 4,317,776, Cl. 260-244.400.
Griffith, Jeffrey D.; and Ozretich, Thomas M., to Dow Chemical Company, The. Method and product for treating soil to suppress the nitrification of ammonium nitrogen therein. 4,317,672, Cl. 71-27.000.
Grimm, Wolfgang: *See—*
Goyert, Wilhelm; Awater, Albert; Grimm, Wolfgang; Ott, Karl-Heinz; Oberkirch, Wolfgang; and Wagner, Hans, 4,317,890, Cl. 525-66.000.
Grosser, Frank R.: *See—*
Scardera, Michael; and Grosser, Frank R., 4,317,940, Cl. 568-625.000.
Grosser, Johannes. Illumination arrangement for microscopes. 4,317,613, Cl. 350-89.000.
Groult, Pierre; Civier, Danielle; and Prehaut, Jacques, to Societe Generale de Constructions Electriques et Mechaniques "Alsthom et Cie". Method of making thin porous strips for fuel cell electrodes. 4,317,789, Cl. 264-105.000.
Grumer, Peter: *See—*
Greve, Heinz; Grumer, Peter; and Gomann, Rolf, 4,317,425, Cl. 118-33.000.
Grumman Aerospace Corporation: *See—*
McDiarmid, Harry P.; and Mihelich, Peter J., 4,317,283, Cl. 30-164.900.
Grun, Larry: *See—*
Bogner, Max; and Grun, Larry, 4,317,264, Cl. 29-8.000.
Grunwell, Joyce F.: *See—*
Benson, Harvey D.; Grunwell, Joyce F.; Johnston, John O.; and Petrov, Vladimir, 4,317,818, Cl. 424-242.000.
Grusa, Bernhard, to Karl M. Reich Maschinenfabrik GmbH. Coiling apparatus for fastener strips. 4,317,546, Cl. 242-55.000.
GTE Automatic Electric Labs Inc.: *See—*
Sabon, Robert J., 4,318,074, Cl. 338-32.00H.
GTE Products Corporation: *See—*
Lapraik, Scott J., 4,317,609, Cl. 339-221.00R.
Guagliardo, Matthew; and Stone, Edward, to Inmont Corporation. Coating compositions of thermoplastic acrylic-urethane copolymers. 4,317,895, Cl. 524-500.000.
Gudmestad, Ragnar, to Artos Engineering Company. Quick change wire cutting and stripping blade tool holder. 4,317,391, Cl. 81-9.510.
Guillaumon, Jean-Claude; and Blet, Louis J. C., to Centre National d'Etudes Spatiales. Electrically conductive white coatings. 4,317,855, Cl. 428-212.000.
Guillot, Jacqueline. Electroconducting cast forming a cutaneous electrode for applying electrical currents to the human body for therapeutic or aesthetic treatment and method of using such electroconducting cast. 4,317,457, Cl. 128-783.000.
Gunther, Peter: *See—*
Ludke, Heimo; Gunther, Peter; and Kleimann, Helmut, 4,317,791, Cl. 264-297.000.
Gut, Edwin; Arnold, Erwin; and Friedli, Hans, to Swiss Aluminium Ltd. Chisel for a crust breaking facility. 4,317,595, Cl. 299-94.000.
Gut, Lillian, executrix: *See—*
Gut, Stanley J., deceased; and Vermillion, Don W., 4,317,253, Cl. 15-390.000.
Gut, Stanley J., deceased (by Gut, Lillian, executrix); and Vermillion, Don W., to Singer Company, The. Rotary brush drive protector. 4,317,253, Cl. 15-390.000.
Guterman, Daniel C.; and Henderson, David L., to Texas Instruments Incorporated. Method of making high coupling ratio DMOS electrically programmable ROM. 4,317,273, Cl. 29-571.000.
Gutermann & Co., Aktiengesellschaft: *See—*
Rottleb, Dieter, 4,317,548, Cl. 242-125.200.
Gutman, Edward J. Vehicle ignition-transmission protection enclosure. 4,317,346, Cl. 70-238.000.
H. Krantz GmbH & Co.: *See—*
Voswinckel, Gerhard, 4,317,290, Cl. 34-86.000.
Haase, Donald J.; Walker, David G.; and Ostrowski, Paul C., to Tenneco Chemicals, Inc. Use of amine-aluminum chloride adducts as alkylation inhibitors in a ligand-complexing process. 4,317,950, Cl. 585-852.000.
Haering, Thomas, to Dr. Johannes Heidenhain GmbH. Method for producing high resolution recording medium. 4,317,876, Cl. 430-293.000.
Hafner, Manfred; and Hunold, Heinz, to Erwin Sick GmbH Optik-Elektronik. Entrapment prevention device. 4,317,970, Cl. 200-61.430.
Hajime Industries, Ltd.: *See—*
Yoshida, Hajime, 4,318,080, Cl. 340-146.30Q.
Yoshida, Hajime, 4,318,081, Cl. 340-146.30H.
Halbert, Seymour P.; and Anken, Milton, to Cordis Laboratories, Inc. Waffle-like matrix for immunoassay and preparation thereof. 4,317,810, Cl. 424-12.000.

Halcon SD Group, Inc., The: *See—*
Costa, Lawrence C., 4,317,946, Cl. 568-862.000.
Halene, Clemens; Schlichting, Josef; and Strack, Karl, to Mannesmann Aktiengesellschaft. Making contoured hollows. 4,317,348, Cl. 72-62.000.
Hales, Richard H.: *See—*
Reese, Max G.; and Hales, Richard H., 4,317,921, Cl. 562-444.000.
Hall, John H., to Micro Power Systems, Inc. Semiconductor structure and method. 4,318,118, Cl. 357-54.000.
Hamada, Sumio; Usui, Kenji; and Noguchi, Takeshi, to Nissan Engineering Ltd. Method for measuring concentration of oxidant or reductant. 4,317,705, Cl. 204-1.00T.
Hamaguchi, Kenji; and Hosoya, Mitsuru, to Sony Corporation. Noise reducing circuit for CTD delay line. 4,317,958, Cl. 179-1.00G.
Hammann, Ingeborg: *See—*
Fuchs, Rainer; Naumann, Klaus; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; and Stendel, Wilhelm, 4,317,834, Cl. 424-304.000.
Hannah, Richard E., to Baxter Travenol Laboratories, Inc. Apparatus for suspending a drainage bag. 4,317,550, Cl. 248-95.000.
Hanson, Chris A., to Hanson Industries Incorporated. Wear resisting member for article of footwear. 4,317,295, Cl. 36-117.000.
Hanson, Chris A., to Hanson Industries Incorporated. Boot shell and liner. 4,317,296, Cl. 36-121.000.
Hanson, Chris A., to Hanson Industries Incorporated. Footwear with adjustable flexure. 4,317,297, Cl. 36-121.000.
Hanson Industries Incorporated: *See—*
Hanson, Chris A., 4,317,295, Cl. 36-117.000.
Hanson, Chris A., 4,317,296, Cl. 36-121.000.
Hanson, Chris A., 4,317,297, Cl. 36-121.000.
Hara, Hajime; Orii, Shingo; and Araki, Yoshihiko, to Nippon Oil Co., Ltd. Curable resin composition. 4,317,754, Cl. 525-501.500.
Harbauer, Werner, to Siemens Aktiengesellschaft. Means for actuating electro-magnetic switchgear. 4,318,065, Cl. 335-17.000.
Harris Data Communications, Inc.: *See—*
Eames, Frederick M., Jr., 4,318,033, Cl. 315-382.000.
Harris, Monty E., to Dow Chemical Company, The. Cementing head apparatus and method of operation. 4,317,486, Cl. 166-250.000.
Harris, Richard T.: *See—*
Harris, Theodore R.; and Harris, Richard T., 4,317,502, Cl. 181-280.000.
Harris, Theodore R.; and Harris, Richard T. Engine exhaust muffler. 4,317,502, Cl. 181-280.000.
Harrison, John M.: *See—*
Johnson, Avery R.; and Harrison, John M., 4,317,960, Cl. 179-18.0BC.
Hartemann, Pierre, to Thomson-CSF. Surface acoustic wave pressure gauge. 4,317,372, Cl. 73-703.000.
Harting, Gary L.: *See—*
Oswald, Alexis A.; Harting, Gary L.; and Barnum, Harry W., 4,317,737, Cl. 252-28.000.
Hartwig, Diane E.: *See—*
Busby, Michael G.; and Hartwig, Diane E., 4,317,879, Cl. 435-14.000.
Harvey, Charles J.; and Wright, Christopher G., to Advance Automation Assembly Limited. Geneva mechanism. 4,317,385, Cl. 74-436.000.
Harwood, Leopold A.; and Wittmann, Erwin J., to RCA Corporation. Symmetrically gain controlled differential amplifier. 4,318,051, Cl. 330-254.000.
Hasegawa, Akio: *See—*
Horiguchi, Sadayuki; Hasegawa, Akio; and Shibukawa, Mitsuru, 4,317,882, Cl. 435-212.000.
Haskell, Donald M.: *See—*
Makovec, Donald J.; and Haskell, Donald M., 4,317,795, Cl. 422-62.000.
Haskin, Roger L.: *See—*
Stratton, Larry J.; Norini, Richard A.; Davis, Peter G.; Dyskievicz, Steve M.; Cowap, Frederic W.; Haskin, Roger L.; Gagner, Mark B.; and Mynett, Thomas M., 4,318,176, Cl. 364-469.000.
Haslanger, Martin F., to E. R. Squibb & Sons, Inc. Method for preparing 10,10-difluoro prostacyclins. 4,317,906, Cl. 542-426.000.
Hastings, Jeanne D. Complete studio. 4,317,606, Cl. 312-231.000.
Hatsuno, Hiroshi; and Okada, Yoshimaro, to Diesel Kiki Co., Ltd. Forging of a camshaft. 4,317,355, Cl. 72-342.000.
Hauck, Frederic P.; and Reid, Joyce, to E. R. Squibb & Sons, Inc. Benzo-cyclitolamines. 4,317,910, Cl. 544-154.000.
Hauni-Werke Korber & Co. KG: *See—*
Greve, Heinz; Grumer, Peter; and Gomann, Rolf, 4,317,425, Cl. 118-33.000.
Hauser, Erhard, to Wilhelm Hedrich Vakuumanlagen GmbH & Co. KG. Dosing system. 4,317,647, Cl. 417-339.000.
Hawk, Eugene D. Cleaning fluid recovery apparatus. 4,317,720, Cl. 210-86.000.
Hawley, Kenneth R., to Bunker Ramo Corporation. Addressing means for random access memory system. 4,318,175, Cl. 364-200.000.
Hayama, Masaru. Solar house. 4,317,443, Cl. 126-429.000.
Hayashi, Hideo: *See—*
Tsuchiya, Shozo; Sasaki, Makoto; and Hayashi, Hideo, 4,317,753, Cl. 524-504.000.
Hayashi, Kenshin: *See—*
Saikawa, Isamu; Takano, Shuntaro; Momonoi, Kaishu; Takakura, Isamu; Kuroda, Seietsu; Tanaka, Kiyoshi; Hayashi, Kenshin; Nagahashi, Bunei; and Kutani, Chiaki, 4,317,907, Cl. 544-21.000.
Hayashi, Masaki: *See—*
Tanouchi, Tadao; Kawamura, Masanori; and Hayashi, Masaki, 4,317,828, Cl. 424-263.000.
Hayashi, Yoshiaki: *See—*
Sakaguchi, Iwao; and Hayashi, Yoshiaki, 4,317,908, Cl. 544-74.000.
Haynes, James T.: *See—*
Hopwood, Francis W.; Muhlbaier, John P.; Oakes, Jeffrey T.; and Haynes, James T., 4,318,055, Cl. 331-12.000.
Haynes, Munro K., to International Business Machines Corp. Buried servo recording systems and methods. 4,318,141, Cl. 360-77.000.
Hazenfield, Robert C.: *See—*
Brownell, Kenneth W.; Bolick, Virgil; Carswell, Joseph; and Hazenfield, Robert C., 4,317,953, Cl. 174-21.00R.
Heady, Robert E., to CPC International Inc. Process for the production of fructose polymers and high fructose syrups. 4,317,880, Cl. 435-94.000.
Heckelman, James D.; and Ziemke, Robert A. Digital anti-theft locking circuit. 4,318,005, Cl. 307-10.0AT.
Heckelsberg, Louis F., to Phillips Petroleum Company. Production of branched hydrocarbons. 4,317,948, Cl. 585-329.000.
Heeren, Richard H.; and Waggener, Herbert A., to Teletype Corporation. Method of manufacturing an insulated gate field-effect transistor therefore in a silicon wafer. 4,317,276, Cl. 29-571.000.
Heideman, Robert J., to Four Seazons Window Corporation. Window construction. 4,317,312, Cl. 49-220.000.
Heim, Ulrich; and Kempin, Hans-Friedhelm, to Dragerwerk Aktiengesellschaft. Method and apparatus for testing a person's breath for the determination of its alcohol content. 4,317,453, Cl. 128-719.000.
Heimann GmbH: *See—*
Rech, Werner; Welsch, Wolfgang; and Zimlich, Josef, 4,318,024, Cl. 313-220.000.
Heja, Gergely: *See—*
Palosi, Endre; Korbonits, Dezso; Kiss, Pal; Gonczy, Csaba; Heja, Gergely; Cser nee Kun, Judit; Szebeni, Rudolf; Szomor nee Wundele, Maria; and Szvoboda nee Kanzel, Ida, 4,317,920, Cl. 562-440.000.
Henderson, David L.: *See—*
Guterman, Daniel C.; and Henderson, David L., 4,317,273, Cl. 29-571.000.
Hendriks, Rudolf; Oude Alink, Aloysius J. W.; and Van Marle, Berend P., to Thomassen Holland B.V. Apparatus for the gasification of fuel. 4,317,658, Cl. 48-61.000.
Henke, Ulrich: *See—*
Dohrmann, Rolf; Henke, Ulrich; and Marusiak, Wojciech, 4,318,070, Cl. 337-3.000.
Hercules Incorporated: *See—*
Dumas, David H., 4,317,756, Cl. 524-607.000.
Herold, Wolf-Dietrich, to ESPE Fabrik Pharmazeurischer Preparate GmbH. Protective case for a quartz-rod optical wave guide. 4,317,615, Cl. 350-96.320.
Herrmann, Christoph; and Streck, Roland, to Chemische Werke Huels, A.G. Process for the production of extensively amorphous homo- and/or copolymers of α-olefins of 3 or more carbon atoms. 4,317,897, Cl. 526-116.000.
Hertzog, Russel C., Jr.; and Nelligan, William B., to Schlumberger Technology Corporation. Methods and apparatus for constituent analysis of earth formations. 4,317,993, Cl. 250-270.000.
Heuer, Daniel A., to Magnavox Company, The. Microprocessor control system for television receivers. 4,318,130, Cl. 358-191.100.
Hewlett-Packard Company: *See—*
Wilson, Robert L., 4,317,985, Cl. 219-210.000.
Heyland, James H., to Illinois Tool Works Inc. Two-way pressure relief valve. 4,317,467, Cl. 137-493.000.
Heyman, Roald G.: *See—*
De Vries, Paul; Gewitz, Steven; and Heyman, Roald G., 4,317,967, Cl. 179-175.30R.
Hiab-Foco Aktiebolag: *See—*
Andersson, Lars Y., 4,317,524, Cl. 212-146.000.
Hiebl, Berthold: *See—*
Angerman, GottFried; Armbrust, Otto; Dianitsch, Franz; and Hiebl, Berthold, 4,317,240, Cl. 2-436.000.
Higgins, Paul J.: *See—*
Balis, M. Earl; Higgins, Paul J.; and Salser, Josephine S., 4,317,877, Cl. 435-7.000.
Higgins, Raymond; and Hutchings, Graham J., to Imperial Chemical Industries Limited. Production of maleic acid and anhydride. 4,317,777, Cl. 260-346.750.
Hightower, Arthur A., to Lee Turzillo Contracting Company. Material removal device. 4,317,494, Cl. 175-88.000.
Hilbourne, Robert A., to U.S. Philips Corporation. Power supply circuit. 4,318,040, Cl. 323-312.000.
Hilti Aktiengesellschaft: *See—*
Leibhard, Erich, 4,317,529, Cl. 222-146.0HE.
Hilty, Donald C.: *See—*
Faulring, Gloria M.; and Hilty, Donald C., 4,317,678, Cl. 75-58.000.
Himeno, Yoshiharu; and Kubota, Masaki, to Nissan Motor Company, Limited. Switching system. 4,318,006, Cl. 307-38.000.
Hinderer, Helmuth E., to Monsanto Company. SO_3-Containing aromatic polyamides. 4,317,902, Cl. 528-337.000.
Hinson, Lee R., to Fuel Lock Systems. Fuel tank locking device. 4,317,345, Cl. 70-170.000.
Hintikka, Vaino. H.; and Saari, Kaarlo M. J., to Outokumpu Oy. Process for the selective froth-flotation of phosphate and carbonate minerals from finely-divided phosphate-carbonate-silicate ores or concentrates. 4,317,715, Cl. 209-167.000.

Hirashima, Masayoshi: *See*—
Fukuda, Shin; and Hirashima, Masayoshi, 4,318,127, Cl. 358-147.000.

Hirashima, Shunichi: *See*—
Ida, Shiuichiro; Ohshima, Shoichi; and Hirashima, Shunichi, 4,317,386, Cl. 74-467.000.

Hirose, Noriyasu; and Souda, Shigeru, to Eisai Co., Ltd. Phenethylamine derivatives and bronchdilator containing the same. 4,317,930, Cl. 564-363.000.

Hitachi Construction Machinery Co., Ltd.: *See*—
Ikeda, Akinori; Nagai, Fuyuki; and Okuno, Takashi, 4,317,466, Cl. 137-115.000.

Hitachi, Ltd.: *See*—
Hori, Yasuro, 4,318,068, Cl. 336-100.000.
Kubota, Takashi; and Ichimura, Shinya, 4,318,143, Cl. 360-84.000.
Kurosaki, Toshiei; and Takanashi, Akihiro, 4,317,383, Cl. 74-110.000.
Susa, Kenzo; Matsuyama, Iwao; Satoh, Shin; and Suganuma, Tsuneo, 4,317,668, Cl. 65-29.000.
Yamada, Naoki; and Wada, Kenichi, 4,318,172, Cl. 364-200.000.
Yasunari, Kenjiro, 4,317,274, Cl. 29-571.000.

Hobbs, John C.: *See*—
Livermore, Malcolm J.; and Hobbs, John C., 4,318,158, Cl. 362-29.000.

Hoch, Manfried L.: *See*—
Scarnato, Thomas J.; Hoch, Manfried L.; and Miner, Robert C., 4,317,580, Cl. 280-415.00R.

Hoechst Aktiengesellschaft: *See*—
Gord, Herbert; and Becker, Reinhold, 4,317,794, Cl. 264-559.000.
Scheler, Siegfried; and Thoese, Klaus, 4,317,875, Cl. 430-8.000.

Hoehn, Hans, to E. R. Squibb & Sons, Inc. Antimicrobial derivatives of 3-(1H-imidazol-1-yl)-2-propen-1-ones. 4,317,831, Cl. 424-273.00R.

Hoenninger, John C., III: *See*—
Crooks, Lawrence E.; Hoenninger, John C., III; and Arakawa, Mitsuaki, 4,318,043, Cl. 324-309.000.

Hoffmann, Hellmut, to Bayer Aktiengesellschaft. 1-Oxo-3-methyl-2-butene phosphonic acid esters. 4,317,783, Cl. 260-937.000.

Hoffmann, Kurt, to Siemens Aktiengesellschaft. Semiconductor device for the reproduction of acoustic signals. 4,318,188, Cl. 365-45.000.

Hoffmann-La Roche Inc.: *See*—
Bernauer, Karl; and Pfoertner, Karlheinz, 4,317,914, Cl. 548-239.000.
Burri, Kasper F.; and Rosen, Perry, 4,317,775, Cl. 260-239.100.
Confalone, Pasquale N.; Pizzolato, Giacomo; Uskokovic, Milan R.; and Rouge, Marianne, 4,317,915, Cl. 549-68.000.
Li, Choh Hao, 4,317,770, Cl. 260-112.50E.

Hoffmann, Ruprecht: *See*—
Scheffels, Wilhelm; and Hoffmann, Ruprecht, 4,317,983, Cl. 219-121.0EA.

Hofstetter, John R., to Upjohn Company, The. Process for the purification of lincomycin. 4,317,903, Cl. 536-11.000.

Hogg, James W., to Anchor Wire Corporation. Non destructably removable adhesive backing strip and article securing device utilizing same. 4,317,555, Cl. 248-467.000.

Holik, Melville J., to International Minerals & Chemical Corp. Foundry no-bake combination resin binder. 4,317,896, Cl. 525-501.000.

Hollymatic Corporation: *See*—
Wagner, Richard C., 4,317,259, Cl. 17-32.000.

Homeyer, Bernhard: *See*—
Fuchs, Rainer; Naumann, Klaus; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; and Stendel, Wilhelm, 4,317,834, Cl. 424-304.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Honda, Shoichi, 4,317,574, Cl. 277-160.000.
Kume, Tadashi; Fujimori, Yoshitsugu; and Inoh, Isamu, 4,317,725, Cl. 210-235.000.
Yagi, Shizuo; Otani, Junji; Ikenoya, Yasuo; and Kogure, Hiroshi, 4,317,438, Cl. 123-432.000.

Honda, Shoichi, to Honda Giken Kogyo Kabushiki Kaisha. Expander for piston ring. 4,317,574, Cl. 277-160.000.

Honda, Toshio; Tanuma, Itsuo; Ogawa, Masao; Ishikawa, Hikaru; Fukuura, Yukio; Akiyama, Setsuo; Ojima, Shozo; and Naito, Kazuo, to Bridgestone Tire Company Limited. Sandwich glass. 4,317,862, Cl. 428-442.000.

Honeywell Inc.: *See*—
Bowers, John E.; and Schmit, Joseph L., 4,317,689, Cl. 148-171.000.
Stauffer, Norman L., 4,317,991, Cl. 250-201.000.
Stauffer, Norman L., 4,317,992, Cl. 250-221.000.

Honeywell Information Systems Inc.: *See*—
Bachman, Charles W.; and Bouvard, Jacques, 4,318,182, Cl. 364-200.000.

Hooke, Noel H.: *See*—
Steel, Thomas; Hooke, Noel H.; and Pask, George, 4,317,646, Cl. 415-116.000.

Hooker Chemicals & Plastics Corp.: *See*—
Robota, Stephen; and Baxamusa, Yusuf A., 4,317,805, Cl. 423-240.000.

Hooykaas, Carel W. J., to Pelt & Hooykaas B.V. Process of converting polluting particles, emitted in chemical or physical processes, into harmless substances. 4,317,684, Cl. 106-316.000.

Hopwood, Francis W.; Muhlbaier, John P.; Oakes, Jeffrey T.; and Haynes, James T., to Westinghouse Electric Corp. Digitally controlled phase lock distillator system. 4,318,055, Cl. 331-12.000.

Hori, Yasuro, to Hitachi, Ltd. Induction device equipped with vibration suppressor. 4,318,068, Cl. 336-100.000.

Horiguchi, Sadayuki; Hasegawa, Akio; and Shibukawa, Mitsuru, to Asahi Kasei Kogyo Kabushiki Kaisha. Production of plasminogen activator. 4,317,882, Cl. 435-212.000.

Horman, Ian: *See*—
Brambilla, Edgardo; and Horman, Ian, 4,317,841, Cl. 426-239.000.

Horvath, Joseph. Sidereal time compensation device for astronomical telescope. 4,317,612, Cl. 350-83.000.

Hosoda, Tokushiro: *See*—
Karasawa, Kunihiko; Hosoda, Tokushiro; Mase, Hiroshi; Sato, Yasuo; and Shimada, Shoji, 4,317,845, Cl. 427-47.000.

Hosoi, Toshiaki. Machine tool profiling device. 4,317,644, Cl. 409-98.000.

Hosotani, Yohzoh: *See*—
Souma, Hideaki; Konno, Norimitsu; Hosotani, Yohzoh; and Shibata, Jyuzo, 4,317,676, Cl. 75-5.000.

Hosoya, Mitsuru: *See*—
Hamaguchi, Kenji; and Hosoya, Mitsuru, 4,317,958, Cl. 179-1.00G.

Hostrup, Kai R.: *See*—
Milberger, Lionel J.; Denk, Eddie W.; and Hostrup, Kai R., 4,317,490, Cl. 175-20.000.

Hotti, Martti. Building block assembly. 4,317,306, Cl. 46-26.000.

Hou, Liping D.: *See*—
Tanaka, Kunihide; Elliott, Michael T.; Chung, Sam; Pau, James; Gray, Linda; Hou, Liping D.; F'Mayer, Mary; Warren, David; and Finch, Karen, 4,317,700, Cl. 156-652.000.

Hryck, Michael D.: *See*—
Bolcavage, Richard D.; Hryck, Michael D.; Kauczka, William B.; and Kinter, Harold B., 4,317,412, Cl. 101-93.010.

Hsiao, James K., to United States of America, Navy. Clutter filter using a minimum number of radar pulses. 4,318,099, Cl. 343-5.0SW.

Hsieh, Hsin H., to Dow Chemical Company, The. Catalytic oxidation of phenols to 1,4-benzoquinones. 4,317,745, Cl. 252-428.000.

Huang, Warren H.: *See*—
Stewart, William S.; Funk, Gary L.; and Huang, Warren H., 4,318,178, Cl. 364-502.000.

Hubert, Guy; and Michel, Edmond, to Solvay & Cie. Process for the production of oriented hollow bodies. 4,317,793, Cl. 264-521.000.

Hubred, Gale L.; and Lewis, Robert T., to Chevron Research Company. Purification of aqueous liquids used in manganese nodule processing. 4,317,730, Cl. 210-695.000.

Hudson, Sharon J., Jr., to Sharon Manufacturing Company. Oil separator device. 4,317,662, Cl. 55-392.000.

Huftel, Terrance D.; Odegaard, Lester B.; and Rasmussen, Thomas K., to Minnesota Mining and Manufacturing Company. Stapler with tapered anvil. 4,317,535, Cl. 227-19.000.

Huggins, William H.: *See*—
Chalmers, Edward; and Huggins, William H., 4,317,450, Cl. 128-303.130.

Hughes Aircraft Company: *See*—
Colles, Joseph H., 4,318,052, Cl. 330-255.000.
Jergenson, Jerg B., 4,318,029, Cl. 315-111.810.
Jergenson, Jerg B., 4,318,030, Cl. 315-111.810.
Zwirn, Robert, 4,318,129, Cl. 358-174.000.

Hughes, Richard H.; and Chen, Hsing-Yao, to RCA Corporation. High potential, low magnification electron gun. 4,318,027, Cl. 315-15.000.

Hughie Big Canoe: *See*—
Porte, Allen L., 4,317,237, Cl. 2-2.000.

Huliba, David A., to Mead Corporation, The. Ink jet printer having continuous recirculation during shut down. 4,318,114, Cl. 346-140.00R.

Hume, James G., to Xerox Corporation. Ribbon cartridge. 4,317,636, Cl. 400-208.000.

Hunold, Heinz: *See*—
Hafner, Manfred; and Hunold, Heinz, 4,317,970, Cl. 200-61.430.

Hunter, Kent. Security fence system. 4,318,088, Cl. 340-541.000.

HurletronAltair, Inc.: *See*—
Stratton, Larry J.; Norini, Richard A.; Davis, Peter G.; Dyskievicz, Steve M.; Cowap, Frederic W.; Haskin, Roger L.; Gagner, Mark B.; and Mynett, Thomas M., 4,318,176, Cl. 364-469.000.

Hurley, George L., III; and Krystek, Michael S., to General Atomic Company. Apparatus for producing square shaped pulses from a generally sinusoidally shaped signal. 4,318,010, Cl. 307-261.000.

Hutchings, Graham J.: *See*—
Higgins, Raymond; and Hutchings, Graham J., 4,317,777, Cl. 260-346.750.

Hutchinson, Robert S.; and Greiner, William L., III, to Prismo Universal Corporation. Apparatus for applying plastic tape. 4,317,696, Cl. 156-523.000.

Huthwelker, Dirk; Franz, Arnold; and Kopnick, Siegfried, to Dynamit Nobel AG. Insulating-material bodies having metal particles dispersed in the resin. 4,317,856, Cl. 428-273.000.

Hutton, Jonathan, to Imperial Chemical Industries Limited. Process for the manufacture of p-hydroxybenzyl cyanide. 4,317,781, Cl. 260-465.00F.

I.M.A. - Industria Macchine Automatiche S.p.A.: *See*—
Romagnoli, Andrea, 4,317,399, Cl. 83-237.000.

Ichijo, Michio, to Director-General of Agency of Industrial Science and Technology. Process for the selective removal of ferric ion from an aqueous solution containing ferric and other metal ions. 4,317,804, Cl. 423-139.000.

Ichimura, Shinya: *See*—
Kubota, Takashi; and Ichimura, Shinya, 4,318,143, Cl. 360-84.000.

Ichisaka, Teruo; and Shinomiya, Yoshitugu, to Chlorine Engineers Corp., Ltd. Apparatus for electrolyzing an aqueous solution. 4,317,709, Cl. 204-268.000.

Ida, Shiuichiro; Ohshima, Shoichi; and Hirashima, Shunichi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Mechanism for lubricating an output pilot bearing of a gear transmission. 4,317,386, Cl. 74-467.000.

Ideal Industries, Inc.: *See*—
Wells, Peter M., Jr., 4,317,262, Cl. 24-16.0PB.

Ihrman, Kryn G.: *See*—
Wollensak, John C.; Ihrman, Kryn G.; and Jarema, Chester P., 4,317,931, Cl. 564-409.000.

Iino, Kinzo; Ohta, Ken-Ichiro; and Aibe, Hiroshi, to Watanabe Sokki Kabushiki Kaisha. Multi-channel recording instrument. 4,318,110, Cl. 346-32.000.

Ike, Kazuo; Tachi, Katsuichi; and Kato, Tetsuro, to Sony Corporation. Rotary head assembly. 4,318,146, Cl. 360-107.000.

Ikeda, Akinori; Nagai, Fuyuki; and Okuno, Takashi, to Hitachi Construction Machinery Co., Ltd. Hydraulic drive circuit for load-handling machines. 4,317,466, Cl. 137-115.000.

Ikeda, Hiroshi: *See*—
Tanabe, Zenichi; Fukui, Toshiyasu; Ikeda, Hiroshi; Miura, Tatsuo; and Sugiura, Taketoshi, 4,317,484, Cl. 165-134.00R.

Ikeda, Yoshiyuki: *See*—
Katsuta, Takeshi; Ikeda, Yoshiyuki; and Inoue, Atsuo, 4,317,691, Cl. 149-2.000.

Ikenoya, Yasuo: *See*—
Yagi, Shizuo; Otani, Junji; Ikenoya, Yasuo; and Kogure, Hiroshi, 4,317,438, Cl. 123-432.000.

Ikimi, Kiyoshi: *See*—
Takano, Tetsuo; Suzukamo, Gohu; Ishino, Masaru; and Ikimi, Kiyoshi, 4,317,918, Cl. 562-406.000.

Illinois Tool Works Inc.: *See*—
Heyland, James H., 4,317,467, Cl. 137-493.000.

Imada, Kiyoshi; Ueno, Susumu; Nishina, Yasuhide; and Nomura, Hirokazu, to Shin-Etsu Chemical Co. Ltd. Method for modifying surface properties of a shaped article of an acrylic resin. 4,317,788, Cl. 264-22.000.

Imai, Chikara: *See*—
Eda, Tadahiro; Tatsumi, Susumu; and Imai, Chikara, 4,318,042, Cl. 324-72.500.

Imai, Tamotsu, to UOP Inc. Purification of dicarboxylic aromatic acids. 4,317,923, Cl. 562-487.000.

Imanaga, Yasuhiko: *See*—
Tsuda, Katsuhiro; Tanaka, Hisao; Nagae, Michio; and Imanaga, Yasuhiko, 4,317,760, Cl. 524-111.000.

Imparato, Luigi: *See*—
Mancini, Giuseppe; Imparato, Luigi; and Berti, Franco, 4,317,780, Cl. 260-410.600.

Imperial Chemical Industries Limited: *See*—
Cartwright, David, 4,317,913, Cl. 546-345.000.
Higgins, Raymond; and Hutchings, Graham J., 4,317,777, Cl. 260-346.750.
Hutton, Jonathan, 4,317,781, Cl. 260-465.00F.
Jones, Peter J.; and Royall, David J., 4,317,919, Cl. 562-414.000.
MacLennan, David G.; Ousby, John C.; Owen, Terence R.; and Steer, David C., 4,317,843, Cl. 426-656.000.

Index-Werke KG Hahn & Tessky: *See*—
Link, Helmut F.; and Waiblinger, Paul, 4,317,394, Cl. 82-2.500.

Ing. C. Olivetti & C., S.p.A.: *See*—
Galvagni, Alighiero, 4,318,144, Cl. 360-99.000.

Ingemanssons Ingenjorsbyra AB: *See*—
Soderquist, Jan; and Einarsson, Stefan, 4,317,503, Cl. 181-290.000.

Ingersoll-Rand Company: *See*—
Bardsley, Donald E., 4,317,724, Cl. 210-225.000.

Inmont Corporation: *See*—
Guagliardo, Matthew; and Stone, Edward, 4,317,895, Cl. 524-500.000.

Innovative Design, Inc.: *See*—
Sargent, Jack, 4,317,989, Cl. 235-92.0DN.

Inoh, Isamu: *See*—
Kume, Tadashi; Fujimori, Yoshitsugu; and Inoh, Isamu, 4,317,725, Cl. 210-235.000.

Inoue, Atsuo: *See*—
Katsuta, Takeshi; Ikeda, Yoshiyuki; and Inoue, Atsuo, 4,317,691, Cl. 149-2.000.

Institute Po Microbiologia: *See*—
Popov, Mitko S.; Djedjeva, Galina M.; Todorov, Ivan O.; and Stoeva, Nelly S., 4,317,883, Cl. 435-234.000.

International Business Machines Corporation: *See*—
Bolcavage, Richard D.; Hryck, Michael D.; Kauczka, William B.; and Kinter, Harold B., 4,317,412, Cl. 101-93.010.
Goodrich, Russell A.; Lengerman, Larry H.; and Timbeross, James K., 4,317,980, Cl. 219-117.100.
Haynes, Munro K., 4,318,141, Cl. 360-77.000.
Kuseski, Roger E., 4,317,629, Cl. 355-24.000.
Petersen, Kurt E., 4,317,611, Cl. 350-6.600.
White, James M., 4,318,122, Cl. 358-41.000.

International Harvester Company: *See*—
Scarnato, Thomas J.; Hoch, Manfried L.; and Miner, Robert C., 4,317,580, Cl. 280-415.00R.

International Minerals & Chemical Corp.: *See*—
Holik, Melville J., 4,317,896, Cl. 525-501.000.

International Telephone and Telegraph Corporation: *See*—
Chea, Ramon C. W., Jr., 4,317,963, Cl. 179-77.000.
Cox, John E.; Treiber, Robert; and Cotton, John M., 4,317,962, Cl. 179-18.0ES.
Kraushaar, Robert J.; and Ward, Kevin B., 4,317,751, Cl. 252-582.000.

Interox Chemicals Limted: *See*—
Ridgway, John W., 4,317,813, Cl. 424-130.000.

Inui, Taiji: *See*—
Yagi, Yoshiaki; Kouno, Kageaki; and Inui, Taiji, 4,317,881, Cl. 435-97.000.

Ipco Corporation: *See*—
Carmon, Amiram; and Lowe, Daniel, 4,317,278, Cl. 29-878.000.

Irabu, Takeru: *See*—
Musha, Toshimitsu; Sekine, Matsuo; Kiuchi, Eichi; and Irabu, Takeru, 4,318,101, Cl. 343-5.0CF.

Iseli, Gottfried, to Laspo AG. Firing butt including a housing for a target. 4,317,572, Cl. 273-406.000.

Ishikawa, Hikaru: *See*—
Honda, Toshio; Tanuma, Itsuo; Ogawa, Masao; Ishikawa, Hikaru; Fukuura, Yukio; Akiyama, Setsuo; Ojima, Shozo; and Naito, Kazuo, 4,317,862, Cl. 428-442.000.

Ishikawa, Hiroshi; Tabusa, Fujio; and Nakagawa, Kazuyuki, to Otsuka Pharmaceutical Co., Ltd. β-Lactam series compound and antibacterial pharmaceutical composition containing the same. 4,317,820, Cl. 424-246.000.

Ishino, Masaru: *See*—
Takano, Tetsuo; Suzukamo, Gohu; Ishino, Masaru; and Ikimi, Kiyoshi, 4,317,918, Cl. 562-406.000.

Ishino, Yasuo: *See*—
Sasaoka, Ryosuke; Ishino, Yasuo; and Maekawa, Kaoru, 4,317,661, Cl. 55-131.000.

Isobe, Takashi; and Aoyagi, Masao, to Canon Kabushiki Kaisha. Index mechanism for coupling control of operational lens units. 4,317,627, Cl. 354-286.000.

Isola Fabrikker A/S: *See*—
Thiis-Evensen, Eyvind M., 4,317,853, Cl. 428-80.000.

Isono, Hiromasa: *See*—
Nishihara, Toshikazu; Isono, Hiromasa; Naruse, Tunehide; Ozaki, Sadao; and Takahashi, Noboru, 4,317,675, Cl. 75-0.5BA.

Ito, Akitoshi: *See*—
Sakano, Hajime; Ito, Akitoshi; and Terada, Miyuki, 4,317,891, Cl. 525-66.000.

Itoh, Tomoo: *See*—
Kawasaki, Hironobu; Yoshida, Kouichirou; and Itoh, Tomoo, 4,317,766, Cl. 524-101.000.

ITT Industries, Inc.: *See*—
Reinartz, Hans-Dieter; and Quitmann, Horst, 4,318,078, Cl. 340-59.000.
Tandler, Peter, 4,317,598, Cl. 303-6.00C.

Iwatsu Electric Co., Ltd.: *See*—
Kokaji, Norio; and Shimada, Nobuyuki, 4,317,630, Cl. 355-50.000.

J. I. Case Comany: *See*—
Marto, John H., 4,317,325, Cl. 56-11.600.

J. M. Voith GmbH: *See*—
Pfalzer, Lothar; and Siegbert/Fischer, Holzwirt, 4,317,701, Cl. 162-234.000.

J. N. Engineering, Inc.: *See*—
Nall, Joseph E., 4,318,008, Cl. 307-84.000.

Jachimowicz, Felek, to W. R. Grace & Co. Preparation of secondary amines. 4,317,932, Cl. 564-445.000.

Jacobs, David R.: *See*—
Spanel, Abram N.; and Jacobs, David R., 4,317,419, Cl. 112-266.200.

Jain, Tikam C., to SmithKline Corporation. Polynitroxin antibiotics produced by *Nocardiopsis mutabilis* Shearer sp. nov. ATCC 31520. 4,317,812, Cl. 424-116.000.

Japan Radio Company, Limited: *See*—
Shimizu, Toshio; Wakabayashi, Atsushi; and Goto, Shuichi, 4,318,100, Cl. 343-5.00W.

Japan Tobacco & Salt Public Corporation, The: *See*—
Chuman, Tatsuji; Kono, Masahiro; and Kato, Kunio, 4,317,836, Cl. 424-331.000.

Jarema, Chester P.: *See*—
Wollensak, John C.; Ihrman, Kryn G.; and Jarema, Chester P., 4,317,931, Cl. 564-409.000.

Jeffers, Frederick J., to Spin Physics, Inc. Magnetic recording apparatus and method. 4,318,136, Cl. 360-17.000.

Jergenson, Jerg B., to Hughes Aircraft Company. Liquid metal ion source. 4,318,029, Cl. 315-111.810.

Jergenson, Jerg B., to Hughes Aircraft Company. Liquid metal ion source. 4,318,030, Cl. 315-111.810.

Jirousek, Norman F.; and Shipitalo, William M., to Towmotor Corporation. Wheel drive assembly. 4,317,498, Cl. 180-70.00R.

Johansson, Sven; Kolsmyr, Roland; Madsen, Kristian D.; and Polvi, Esko, to ASEA Aktiebolag. Rotary AC machine stator with pressure hose supported coil ends. 4,318,021, Cl. 310-260.000.

Johns-Nigrelli-Johns, Inc.: *See*—
Nigrelli, Biagio J., 4,317,320, Cl. 53-374.000.

Johnson, Alfred E.: *See*—
Atwood, Eldon W.; and Johnson, Alfred E., 4,317,316, Cl. 52-93.000.

Johnson, Avery R.; and Harrison, John M., to Small World Exchange, Inc. Telephone-conferencing and inquiry-handling apparatus and method. 4,317,960, Cl. 179-18.0BC.

Johnson, Avery R., to Small World Exchange, Inc. Telephone-conferencing apparatus and method. 4,317,961, Cl. 179-18.0BC.

Johnson & Johnson: *See*—
Beede, Charles H.; and Zirnite, Richard N., 4,317,681, Cl. 106-85.000.

Johnson, Luther R.; and Sapatino, Bruno V., to Becton, Dickinson and Company. Multiple interior surface roller bottle. 4,317,886, Cl. 435-285.000.

Johnson, Steven A., to University of Utah. Ultrasound imaging apparatus and method. 4,317,369, Cl. 73-607.000.

Johnston, John O.: *See*—
Benson, Harvey D.; Grunwell, Joyce F.; Johnston, John O.; and Petrow, Vladimir, 4,317,818, Cl. 424-242.000.

Jones, Aaron U.; Trudeau, Marcel R., deceased; and by Trudeau, Claire, administratrix, to Seneca Sawmill Company. Sawmill apparatus having cant supporting means. 4,317,398, Cl. 83-156.000.

Jones, Claude R.: *See*—
Buchwald, Melvin I.; Jones, Claude R.; and Nelson, Leonard Y., 4,318,057, Cl. 372-70.000.

Jones, Peter J.; and Royall, David J., to Imperial Chemical Industries Limited. Recovery of bromine from effluent gases in the oxidation of substituted aromatics to form aromatic carboxylic acids. 4,317,919, Cl. 562-414.000.

Jordan, David D., to Bendix Corporation, The. Universal joint. 4,317,338, Cl. 64-7.000.

Joshi, Ashok V.; Gillotti, Albert L.; and Sholette, William P., to Ray-O-Vac Corporation. Self healing cathodes. 4,317,874, Cl. 429-213.000.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Aruga, Taketo; and Morita, Koichi, 4,317,331, Cl. 60-436.000.

Kabushiki Kaisha Shikishima Chipton: *See*—
Kobayashi, Hisamine, 4,317,313, Cl. 51-163.200.

Kabushiki Kaisha Suwa Seikosha: *See*—
Toyoda, Mitsuru, 4,317,965, Cl. 179-115.50R.

Kabushiki Kaisha Takahashi Engineering: *See*—
Takahashi, Ikuo, 4,317,406, Cl. 91-39.000.

Kabushiki Kaisha Top: *See*—
Yokoyama, Masayoshi, 4,317,458, Cl. 128-784.000.

Kach, Alfred, to Patelhold Patentverwertungs- & Elektro-Holding AG. Resonator for high frequency electromagnetic oscillations. 4,318,064, Cl. 333-202.000.

Kaisner, Melvin C. Magnetic light fixture. 4,318,159, Cl. 362-124.000.

Kakimoto, Kenichi: *See*—
Katsura, Hiromitsu; Ehashi, Shigeyuki; Tsuchida, Junichi; and Kakimoto, Kenichi, 4,317,682, Cl. 106-288.00B.

Kako, Mikitoshi: *See*—
Kato, Yuzo; Tateno, Hidenori; and Kako, Mikitoshi, 4,317,784, Cl. 261-65.000.

Kakuta, Yoshiyuki: *See*—
Saito, Tadao; Kishi, Takao; and Kakuta, Yoshiyuki, 4,317,531, Cl. 222-321.000.

Kalir, Rami: *See*—
Warshawsky, Abraham; Kalir, Rami; and Patchornik, Abraham, 4,317,887, Cl. 521-38.000.

Kaminaka, Nobuyuki; Kanai, Kenji; Nouchi, Norimoto; and Nomura, Noboru, to Matsushita Electric Industrial Co., Ltd. Thin-film magnetic head. 4,318,148, Cl. 360-127.000.

Kanai, Kenji: *See*—
Kaminaka, Nobuyuki; Kanai, Kenji; Nouchi, Norimoto; and Nomura, Noboru, 4,318,148, Cl. 360-127.000.

Kanda, Katsumi; Kondo, Yoshikazu; and Sugimoto, Yoshiyuki, to Toyo Kohan Co., Ltd. Composite coated metal sheet. 4,317,857, Cl. 428-334.000.

Kanda, Shoichi; Oda, Toshikazu; Tanabe, Yasunosuke; and Arai, Takeshi, to Nitto Kagaku Kogyo Kabushiki Kaisha; and Kawaguchi Kagaku Kogyo Kabushiki Kaisha. Stabilized aqueous solutions of acrylamide polymers. 4,317,759, Cl. 524-93.000.

Kanegae, Hidetoshi: *See*—
Asano, Masaharu; and Kanegae, Hidetoshi, 4,317,364, Cl. 73-117.300.

Kaneko, Toshimi: *See*—
Murakawa, Tetsuya; and Kaneko, Toshimi, 4,318,149, Cl. 361-15.000.

Kanetsu Kogyo Kabushiki Kaisha: *See*—
Nakajima, Takato, 4,317,717, Cl. 209-212.000.

Kanitz, Lawrence L. Golf practice rod. 4,317,569, Cl. 273-200.00B.

Karasawa, Kunihiko; Hosoda, Tokushiro; Mase, Hiroshi; Sato, Yasuo; and Shimada, Shoji, to Asahi Glass Co. Ltd.; and Nihon Parkerizing Co. One side surface molten metallic coating method and apparatus thereof. 4,317,845, Cl. 427-47.000.

Karayannis, Nicholas M.; and Lee, Sam S., to Standard Oil Company (Indiana). Catalyst and process for the polymerization of olefins. 4,317,898, Cl. 526-141.000.

Karch, John A.: *See*—
Burk, Emmett H., Jr.; Yoo, Jin S.; and Karch, John A., 4,317,713, Cl. 208-113.000.

Karkkainen, Jouko, to Oy Wartsila Ab. Valve spindle sealing arrangement. 4,317,573, Cl. 277-113.000.

Karl M. Reich Maschinenfabrik GmbH: *See*—
Gruss, Bernhard, 4,317,546, Cl. 242-55.000.

Karrer, Friedrich: *See*—
Rasberger, Michael; and Karrer, Friedrich, 4,317,911, Cl. 544-222.000.

Kaspersma, Jelle H.; and Shay, Robert H., to Air Products and Chemicals, Inc. Carburizing process utilizing atmospheres generated from nitrogen-ethanol based mixtures. 4,317,687, Cl. 148-16.500.

Kassai Kabushikikaisha: *See*—
Kassai, Kenzou, 4,317,581, Cl. 280-644.000.

Kassai, Kenzou, to Kassai Kabushikikaisha. Baby carriage. 4,317,581, Cl. 280-644.000.

Kataeva, Irina V.: *See*—
Khoroshavin, Anatoly N.; Kataeva, Irina V.; Oborin, Gennady A.; and Krasavin, Alexandr P., 4,317,670, Cl. 71-6.000.

Katagiri, Masayoshi; and Fujii, Takashi, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Aisin Seiki Kabushiki Kaisha. Disc brake. 4,317,508, Cl. 188-218.00A.

Kato, Dane D. Writing implement with improved cartridge holder. 4,317,639, Cl. 401-209.000.

Kato, Kunio: *See*—
Chuman, Tatsuji; Kono, Masahiro; and Kato, Kunio, 4,317,836, Cl. 424-331.000.

Kato, Tetsuro: *See*—
Ike, Kazuo; Tachi, Katsuichi; and Kato, Tetsuro, 4,318,146, Cl. 360-107.000.

Kato, Yoji, to Nippon Soken, Inc. Preheating apparatus for Diesel engines. 4,317,434, Cl. 123-145.00A.

Kato, Yuzo; Tateno, Hidenori; and Kako, Mikitoshi, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Aisan Kogyo Kabushiki Kaisha. Adjust screw device for carburetor. 4,317,784, Cl. 261-65.000.

Katsura, Hiromitsu; Ehashi, Shigeyuki; Tsuchida, Junichi; and Kakimoto, Kenichi, to Toyo Ink Manufacturing Co. Ltd. Pigment compositions and use thereof. 4,317,682, Cl. 106-288.00B.

Katsuta, Takeshi; Ikeda, Yoshiyuki; and Inoue, Atsuo, to Director, Technical Research and Development Institute, Japan Defence Agency; and Nippon Kayaku Kabushiki Kaisha. Liquid or gelled nitroparaffin and metal perchlorate containing explosive composition. 4,317,691, Cl. 149-2.000.

Kauczka, William B.: *See*—
Bolcavage, Richard D.; Hryck, Michael D.; Kauczka, William B.; and Kinter, Harold B., 4,317,412, Cl. 101-93.010.

Kawaguchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Kanda, Shoichi; Oda, Toshikazu; Tanabe, Yasunosuke; and Arai, Takeshi, 4,317,759, Cl. 524-93.000.

Kawai, Syuji: *See*—
Yamashita, Shuzo; Tanaka, Taku; Tanii, Hirokuni; Kubotsu, Akira; and Kawai, Syuji, 4,317,729, Cl. 210-500.200.

Kawakami, Ryuichi; and Nakazawa, Kenichi, to Sony Corporation. Timer display apparatus. 4,318,181, Cl. 364-569.000.

Kawamoto, Akira: *See*—
Nakagawa, Noboru; Oonishi, Toshiyuki; Tsutsumi, Masato; and Kawamoto, Akira, 4,317,335, Cl. 62-199.000.

Kawamura, Kazuo: *See*—
Okuhara, Mitsuhiko; Nishino, Taizou; Kawamura, Kazuo; and Aoki, Toshiaki, 4,318,131, Cl. 358-210.000.

Kawamura, Masanori: *See*—
Tanouchi, Tadao; Kawamura, Masanori; and Hayashi, Masaki, 4,317,828, Cl. 424-263.000.

Kawanabe, Hitoshi: *See*—
Yoshikawa, Toshihumi; Tani, Zempei; Aso, Akira; and Kawanabe, Hitoshi, 4,318,115, Cl. 357-30.000.

Kawasaki, Hironobu; Yoshida, Kouichirou; and Itoh, Tomoo, to Asahi Kasei Kogyo Kabushiki Kaisha. Flame-retardant polyamide resin composition with melamine cyanurate uniformly dispersed therein. 4,317,766, Cl. 524-101.000.

Kehoe, Gary; Puglia, Wayne J.; Witzel, Frank; Friello, Dominick R.; and Mackay, Donald A. M., to Life Savers, Inc. Tobacco-flavored chewing gum. 4,317,837, Cl. 426-3.000.

Keith, H. Dean: *See*—
Summers, David A.; Barker, Clark R.; and Keith, H. Dean, 4,317,492, Cl. 175-79.000.

Kempin, Hans-Friedhelm: *See*—
Heim, Ulrich; and Kempin, Hans-Friedhelm, 4,317,453, Cl. 128-719.000.

Kennedy, Paul L., to Veeder Industries, Inc. Rotary pulse generator. 4,318,018, Cl. 310-156.000.

Kennedy, William N.: *See*—
Degeneff, Robert C.; and Kennedy, William N., 4,318,066, Cl. 336-70.000.

Kentosh, James M., to Amtel, Inc. Mooring terminal for transferring difficult cargo. 4,317,474, Cl. 141-1.000.

Kernforschungsanlage Julich GmbH: *See*—
Sondhaus, Charles A., 4,318,000, Cl. 250-455.000.

Khoroshavin, Anatoly N.; Kataeva, Irina V.; Oborin, Gennady A.; and Krasavin, Alexandr P. Microbiological process for recultivation of industrial refuse heaps. 4,317,670, Cl. 71-6.000.

Kidoh, Kunizoh; Suzuki, Fujio; and Kushida, Kazuo, to Kureha Kagaku Kogyo Kabushiki Kaisha. Synthetic resin for use as adhesive in preparing composite material comprising polyvinylidene fluoride and polyvinyl chloride, said composite and methods for preparing said resin and said composite material. 4,317,861, Cl. 428-421.000.

Kilts, Harold J.; and Swaziek, Laurence J., to Chromalloy American Corporation. Liquid storage tank. 4,317,317, Cl. 52-224.000.

Kim, Leo; Paxson, Timm E.; and Tang, Sunny C., to Shell Oil Company. Hydroformylation process using resin-ligand-metal catalyst. 4,317,936, Cl. 568-454.000.

King, John T., to NCR Canada Ltd - NCR Canada Ltee. Method and apparatus for electronically aligning active elements of an imaging array with an optical system. 4,318,082, Cl. 340-146.30H.

King, Lloyd H., Sr. Attachments for flexible or rigid tubing. 4,317,471, Cl. 137-798.000.

Kingsley, William: *See*—
Allis, Robert F.; Kingsley, William; and Allis, Robert F., 4,318,135, Cl. 358-294.000.

Kinstler, John R.: *See*—
Golata, John H.; and Kinstler, John R., 4,317,597, Cl. 301-63.00R.

Kinter, Harold B.: *See*—
Bolcavage, Richard D.; Hryck, Michael D.; Kauczka, William B.; and Kinter, Harold B., 4,317,412, Cl. 101-93.010.
Kircher, Morton S.: *See*—
Specht, Steven J.; and Kircher, Morton S., 4,317,708, Cl. 204-228.000.
Kirchner, Willem: *See*—
Sloterdijk, Wijtze; Dapper, Gerrit; Verbraak, Cornelis A.; and Kirchner, Willem, 4,317,800, Cl. 423-1.000.
Kishi, Takao: *See*—
Saito, Tadao; Kishi, Takao; and Kakuta, Yoshiyuki, 4,317,531, Cl. 222-321.000.
Kiss, Pal: *See*—
Palosi, Endre; Korbonits, Dezso; Kiss, Pal; Gonczy, Csaba; Heja, Gergely; Cser nee Kun, Judit; Szebeni, Rudolf; Szomor nee Wundele, Maria; and Szvoboda nee Kanzel, Ida, 4,317,920, Cl. 562-440.000.
Kissei Pharmaceutical Co., Ltd.: *See*—
Tanouchi, Tadao; Kawamura, Masanori; and Hayashi, Masaki, 4,317,828, Cl. 424-263.000.
Kita, Toru, to Nissan Motor Co., Ltd. Gas density detecting device for use in internal combustion engine. 4,317,361, Cl. 73-30.000.
Kitaura, Ichiro: *See*—
Yonezawa, Keitaro; and Kitaura, Ichiro, 4,317,358, Cl. 72-448.000.
Kiuchi, Eichi: *See*—
Musha, Toshimitsu; Sekine, Matsuo; Kiuchi, Eichi; and Irabu, Takeru, 4,318,101, Cl. 343-5.0CF.
Kiuchi, Mitsuyuki: *See*—
Mizukawa, Takumi; Amagami, Keizo; Kiuchi, Mitsuyuki; Yoshida, Hirokazu; and Saka, Tatsuo, 4,317,975, Cl. 219-10.49R.
Kivits, Petrus J.; de Bont, Marinus R. J.; and de Poorter, Adriaan W., to U.S. Philips Corporation. Optical recording disc. 4,318,112, Cl. 346-135.100.
Kiyohara, Takao: *See*—
Atsumi, Toshio; Sanjiki, Tetsutaro; and Kiyohara, Takao, 4,317,825, Cl. 424-250.000.
Kjellberg, Evert, to Transco Products, Inc. RF Transfer switch. 4,317,972, Cl. 200-153.00S.
Klaber, Michael C. Foldable pen key ring. 4,317,638, Cl. 401-195.000.
Klayman, Daniel L.; Scovill, John P.; Bartosevich, Joseph F.; Mason, Carl J.; and Griffin, T. Scott, to United States of America, Army. 2-Acetyl-and 2-propionylpyridine thiosemicarbazones. 4,317,776, Cl. 260-244.400.
Kleemann, Axel: *See*—
Klingler, Karl-Heinz; Kleemann, Axel; Stroman, Fritz; and Thiemer, Klaus, 4,317,832, Cl. 424-274.000.
Kleimann, Helmut: *See*—
Ludke, Heimo; Gunther, Peter; and Kleimann, Helmut, 4,317,791, Cl. 264-297.000.
Kleinschmit, Peter: *See*—
Voigt, Carl; Strack, Hans; and Kleinschmit, Peter, 4,317,808, Cl. 423-375.000.
Klingler, Karl-Heinz; Kleemann, Axel; Stroman, Fritz; and Thiemer, Klaus. Indolyl and methylindolyl substituted aminoalkyl guanidines. 4,317,832, Cl. 424-274.000.
Kmetz, William A.: *See*—
Serafino, John B.; and Kmetz, William A., 4,317,799, Cl. 422-249.000.
Knifton, John F., to Texaco Inc. Process for preparing glycol ethers. 4,317,943, Cl. 568-678.000.
Knight Manufacturing Company, Inc.: *See*—
Firmin, Herman P., 4,317,305, Cl. 43-42.240.
Knoche, Bodo. Breast prosthesis. 4,317,241, Cl. 3-36.000.
Knop, Karl H., to RCA Corporation. Solid-state, color-encoding television camera. 4,318,123, Cl. 358-43.000.
Knowlton, Christopher M., to Scott & Fetzer Company, The. Surface cleaning machine. 4,317,246, Cl. 15-83.000.
Knowlton, Christopher W., to Scott & Fetzer Company, The. Sweeper-scrubber. 4,317,252, Cl. 15-320.000.
Kobayashi, Hisamine, to Kabushiki Kaisha Shikishima Chipton. Long-travel annular vibratory barrel finishing apparatus for line-processing. 4,317,313, Cl. 51-163.200.
Kobayashi, Kohroh: *See*—
Mito, Ikuo; Matsushita, Shigeo; and Kobayashi, Kohroh, 4,318,058, Cl. 372-50.000.
Kobayashi, Takashi; and Nitta, Etsurou, to Sumitomo Electric Industries, Ltd. Device for detecting the surface unevenness of wire-shaped material. 4,317,633, Cl. 356-371.000.
Kogure, Hiroshi: *See*—
Yagi, Shizuo; Otani, Junji; Ikenoya, Yasuo; and Kogure, Hiroshi, 4,317,438, Cl. 123-432.000.
Kohl, Karl, to Sulzer Brothers Limited. Slide frame for a warp knitting machine. 4,317,342, Cl. 66-120.000.
Kohlhage, Ernst H., to Luk Lamellen und Kupplungsbau. Method and device for operating an internal-combustion machine with a flywheel coupled thereto. 4,317,435, Cl. 123-179.00J.
Kokaji, Norio; and Shimada, Nobuyuki, to Iwatsu Electric Co., Ltd. Copying machine. 4,317,630, Cl. 355-50.000.
Kollross, Gunter: *See*—
Senders, Henricus H. H., 4,317,256, Cl. 17-1.00R.
Kolomeitseva, Margarita B.: *See*—
Chubarov, Evgeny P.; Kubyshkin, Viktor A.; Mitrofanov, Vladimir E.; Emelyanov, Alexandr N.; Butkovsky, Anatoly G.; Norkin, Kemer B.; Aizenshtein, Anatoly G.; Kolomeitseva, Margarita B.; Suvorov, Arthur M.; and Vazhnov, Sergei A., 4,317,981, Cl. 219-121.0EA.
Kolsmyr, Roland: *See*—
Johansson, Sven; Kolsmyr, Roland; Madsen, Kristian D.; and Polvi, Esko, 4,318,021, Cl. 310-260.000.
Kombi-Lift Montage- und Handelsgesellschaft mbH: *See*—
Schneider, Erich, 4,317,505, Cl. 187-17.000.
Kombinat Produkcji i Montazu Obiektow Budownictwa Ogolnego z Lekkich Konstrukcji Stalowych "Metalplast": *See*—
Mellerowicz, Ryszard, 4,317,848, Cl. 427-309.000.
Kondo, Yoshikazu: *See*—
Kanda, Katsumi; Kondo, Yoshikazu; and Sugimoto, Yoshiyuki, 4,317,857, Cl. 428-334.000.
Konno, Norimitsu: *See*—
Souma, Hideaki; Konno, Norimitsu; Hosotani, Yohzoh; and Shibata, Jyuzo, 4,317,676, Cl. 75-5.000.
Kono, Masahiro: *See*—
Chuman, Tatsuji; Kono, Masahiro; and Kato, Kunio, 4,317,836, Cl. 424-331.000.
Konstant, Anthony N.; and Weider, John J., to Speedshelf International, Inc. Storage structure having two-piece beams. 4,317,523, Cl. 211-187.000.
Kooijmans, Petrus G.; and Kunze, Wolfgang, to Shell Oil Company. Water-thinnable epoxy resin-sulphanilic acid binder compositions. 4,317,757, Cl. 524-541.000.
Koomen, Joannes J. M.; and Salters, Roelof H. W., to Signetics Corporation. Self-aligned double polysilicon MOS fabrication. 4,317,690, Cl. 148-187.000.
Kopnick, Siegfried: *See*—
Huthwelker, Dirk; Franz, Arnold; and Kopnick, Siegfried, 4,317,856, Cl. 428-273.000.
Korbonits, Dezso: *See*—
Palosi, Endre; Korbonits, Dezso; Kiss, Pal; Gonczy, Csaba; Heja, Gergely; Cser nee Kun, Judit; Szebeni, Rudolf; Szomor nee Wundele, Maria; and Szvoboda nee Kanzel, Ida, 4,317,920, Cl. 562-440.000.
Korf-Stahl AG.: *See*—
Weber, Ralph; Elsner, Emil; Maschlanka, Walter; Rollinger, Bernt; and Sanders, Gerhard, 4,317,677, Cl. 75-43.000.
Kornrumpf, William P.; Park, John N.; and Chen, De Y., to General Electric Company. Resonant-flyback power supply with filament winding for magnetron and the like loads. 4,318,165, Cl. 363-21.000.
Kotani, Shozo: *See*—
Shiba, Tetsuo; Kotani, Shozo; Yamamura, Yuichi; Nagase, Osamu; and Ogawa, Hidemasa, 4,317,771, Cl. 260-112.50R.
Kouno, Kageaki: *See*—
Yagi, Yoshiaki; Kouno, Kageaki; and Inui, Taiji, 4,317,881, Cl. 435-97.000.
Krakauer, Merrill. All-purpose merchandiser. 4,317,604, Cl. 312-97.100.
Krakovetsky-Kocherzhinsky, Jury A.: *See*—
Vasilenko, Vladimir I.; Krakovetsky-Kocherzhinsky, Jury A.; Shishkin, Evgeny A.; and Bojko, Jury A., 4,317,360, Cl. 73-15.00B.
Kramis, Jost; and Ackermann, Jakob, to SIA Schweizer Schmirgel-und Schleif-Industrie AG. Manufacturing of flexible abrasives. 4,317,660, Cl. 51-295.000.
Kramis, Werner: *See*—
Ebner, Walter; Kramis, Werner; and Studer, Gustav, 4,317,405, Cl. 89-37.00G.
Krasavin, Alexandr P.: *See*—
Khoroshavin, Anatoly N.; Kataeva, Irina V.; Oborin, Gennady A.; and Krasavin, Alexandr P., 4,317,670, Cl. 71-6.000.
Kratel, Gunter; Stohr, Gunter; and Scherer, Heinz, to Wacker-Chemie GmbH. Room temperature vulcanizable organopolysiloxane compositions. 4,317,762, Cl. 523-203.000.
Krause, Kenneth E., to Exxon Production Research Company. In-motion weighing system. 4,317,496, Cl. 177-163.000.
Kraushaar, Robert J.; and Ward, Kevin B., to International Telephone and Telegraph Corporation. Thallium doped potassium iodide filter. 4,317,751, Cl. 252-582.000.
Krauss-Maffei Aktiengesellschaft: *See*—
Wilkesmann, Helmut, 4,317,728, Cl. 210-370.000.
Krieg, Adrian H., to Widder Corporation. Power feed apparatus for tools. 4,317,280, Cl. 30-92.000.
Krude, Werner; and Muller, Karl-Heinz, to Uni-Cardan Aktiengesellschaft. Lubricating seal for universal joint. 4,317,340, Cl. 64-17.00A.
Krude, Werner, to Uni-Cardan AG. Universal joint. 4,317,341, Cl. 64-17.00A.
Krupa, John E.; Magness, Preston L.; and Brady, Thomas J., to RCA Corporation. Symmetrical waveform signal generator having coherent frequency shift capability. 4,318,045, Cl. 328-18.000.
Krupp-Koppers GmbH: *See*—
Tewes, Giesbert; and Schmidt-Traub, Henner, 4,317,366, Cl. 73-339.00A.
Krystek, Michael S.: *See*—
Hurley, George L., III; and Krystek, Michael S., 4,318,010, Cl. 307-261.000.
Kubota, Masaki: *See*—
Himeno, Yoshiharu; and Kubota, Masaki, 4,318,006, Cl. 307-38.000.
Kubota, Takashi; and Ichimura, Shinya, to Hitachi, Ltd. Video signal recording-reproduction apparatus. 4,318,143, Cl. 360-84.000.
Kubotsu, Akira: *See*—
Yamashita, Shuzo; Tanaka, Taku; Tanii, Hirokuni; Kubotsu, Akira; and Kawai, Syuji, 4,317,729, Cl. 210-500.200.
Kubyshkin, Viktor A.: *See*—
Chubarov, Evgeny P.; Kubyshkin, Viktor A.; Mitrofanov, Vladimir E.; Emelyanov, Alexandr N.; Butkovsky, Anatoly G.; Norkin, Kemer B.; Aizenshtein, Anatoly G.; Kolomeitseva, Marga-

rita B.; Suvorov, Arthur M.; and Vazhnov, Sergei A., 4,317,981, Cl. 219-121.0EA.
Kuharic, Ivan F.: *See*—
Dickey, Joe B., Jr.; Kuharic, Ivan F.; and Lindahl, Paul A., Jr., 4,317,785, Cl. 261-111.000.
Kuhfus, Gerd, to Northern Telecom Limited. Multiple cantilever spring contact switch. 4,317,968, Cl. 200-5.00R.
Kuhnle, Ernst; and Schwarz, Josef, to Bizerba-Werke Wilhelm Kraut KG. Device for protecting a flexural force receiver against overloading. 4,317,495, Cl. 177-157.000.
Kume, Tadashi; Fujimori, Yoshitsugu; and Inoh, Isamu, to Honda Giken Kogyo Kabushiki Kaisha. Portable artificial kidney with separable parts. 4,317,725, Cl. 210-235.000.
Kume, Toyohiko: *See*—
Saito, Junichi; and Kume, Toyohiko, 4,317,937, Cl. 568-488.000.
Kunze, Wolfgang: *See*—
Kooijmans, Petrus G.; and Kunze, Wolfgang, 4,317,757, Cl. 524-541.000.
Kuo, Chang-kiang; and Tsaur, Shyh-Chang, to Texas Instruments Incorporated. High density, electrically erasable, floating gate memory cell. 4,317,272, Cl. 29-571.000.
Kuraray Co., Ltd.: *See*—
Yamashita, Shuzo; Tanaka, Taku; Tanii, Hirokuni; Kubotsu, Akira; and Kawai, Syuji, 4,317,729, Cl. 210-500.200.
Kure-Jensen, Jens; and Missana, Adrian, to General Electric Company. Thrust bearing misalignment monitor. 4,318,179, Cl. 364-506.000.
Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Kidoh, Kunizoh; Suzuki, Fujio; and Kushida, Kazuo, 4,317,861, Cl. 428-421.000.
Kureha, Takeshi, to Matsushita Electric Industrial Company, Limited. Convergence circuit including a quadrant separator. 4,318,032, Cl. 315-368.000.
Kuriki, Shigeya, to OKI Electric Industry Co., Ltd. Speech control circuit. 4,317,959, Cl. 179-1.0VC.
Kurita, Tetsuya. Filtration-compression type filter press. 4,317,734, Cl. 210-780.000.
Kuroda, Seietsu: *See*—
Saikawa, Isamu; Takano, Shuntaro; Momonoi, Kaishu; Takakura, Isamu; Kuroda, Seietsu; Tanaka, Kiyoshi; Hayashi, Kenshin; Nagahashi, Bunei; and Kutani, Chiaki, 4,317,907, Cl. 544-21.000.
Kurosaki, Toshiei; and Takanashi, Akihiro, to Hitachi, Ltd. Proportional linear output system. 4,317,383, Cl. 74-110.000.
Kuseski, Roger E., to International Business Machines Corporation. Job recovery method and system. 4,317,629, Cl. 355-24.000.
Kushida, Kazuo: *See*—
Kidoh, Kunizoh; Suzuki, Fujio; and Kushida, Kazuo, 4,317,861, Cl. 428-421.000.
Kuss, John D. Auxiliary sun visors. 4,317,589, Cl. 296-97.00D.
Kutani, Chiaki: *See*—
Saikawa, Isamu; Takano, Shuntaro; Momonoi, Kaishu; Takakura, Isamu; Kuroda, Seietsu; Tanaka, Kiyoshi; Hayashi, Kenshin; Nagahashi, Bunei; and Kutani, Chiaki, 4,317,907, Cl. 544-21.000.
Kyowa Hakko Kogyo Co., Ltd.: *See*—
Nakanishi, Toru; and Shigemasa, Yoshimi, 4,317,878, Cl. 435-10.000.
Labarre, Jean-Francois; Sournies, Francois; van de Grampel, Johan C.; and van der Huizen, Andriaan A., to Agence Nationale de Valorisation de la Recherche (ANVAR). Inorganocyclic compounds usable as medicaments and a process for their preparation. 4,317,773, Cl. 260-239.0EP.
Labaz: *See*—
Pigerol, Charles; Chandavoine, Marie-Madeleine; and de Cointet de Fillain, Paul, 4,317,768, Cl. 524-99.000.
Labofina S.A.: *See*—
Cahen, Raymond M., 4,317,924, Cl. 562-487.000.
Lagana', Vincenzo, to Snamprogetti S.p.A. Apparatus for distributing a liquid in film-form on the interior walls of vertical tubes. 4,317,786, Cl. 261-112.000.
Lagana', Vincenzo, to Snamprogetti S.p.A. Device for distributing a liquid in thin-film form in vertical heat-exchangers. 4,317,787, Cl. 261-112.000.
Lam, Tat C.: *See*—
Thornburg, David D.; Flegal, Robert M.; and Lam, Tat C., 4,318,096, Cl. 340-706.000.
Lampson, George P.: *See*—
Bertland, Alexander U.; and Lampson, George P., 4,317,811, Cl. 424-89.000.
Lancaster, Patrick R.; and Lancaster, William G., to Lantech, Inc. Rotatable film wrapping apparatus with wrap carrying mechanism. 4,317,322, Cl. 53-399.000.
Lancaster, William G.: *See*—
Lancaster, Patrick R.; and Lancaster, William G., 4,317,322, Cl. 53-399.000.
Lane, Perry M.: *See*—
Stephens, Leonard W.; and Salladay, Mack, 4,317,392, Cl. 81-63.100.
Lang, Hi-Roy-Oshi; and Matsushita, Shigeo, to Nippon Electric Co., Ltd. Semiconductor laser device having plural active regions. 4,318,059, Cl. 372-47.000.
Langan, Allen W.: *See*—
Schwartz, Edwin L.; and Langan, Allen W., 4,317,468, Cl. 137-540.000.
Lantech, Inc.: *See*—
Lancaster, Patrick R.; and Lancaster, William G., 4,317,322, Cl. 53-399.000.
Lapointe, Joseph A., to Domtar Inc. Chipper. 4,317,544, Cl. 241-57.000.
Lapraik, Scott J., to GTE Products Corporation. Electrical contact. 4,317,609, Cl. 339-221.00R.
Larson, Ralph H.: *See*—
Miller, Cardell E.; Folley, Robert F.; and Larson, Ralph H., 4,317,475, Cl. 141-95.000.
Laso, Felipe. Preparation and method for treating burns. 4,317,814, Cl. 424-130.000.
Laspo AG: *See*—
Iseli, Gottfried, 4,317,572, Cl. 273-406.000.
Lauterbach, Heinz, to Robert Bosch GmbH. Apparatus for the measurement of the mass of a flowing medium. 4,317,365, Cl. 73-204.000.
Lawson, John E., to Armco Inc. Split fastening ring and assemblies employing same. 4,317,587, Cl. 285-137.00A.
Le Blanc-Soreau, Annie: *See*—
Le Mehaute, Alain; Rouxel, Jean; and Le Blanc-Soreau, Annie, 4,317,873, Cl. 429-197.000.
LeBlang, Dennis W. Inflatable shelter. 4,317,315, Cl. 52-2.000.
Lederle, Henry F.; and Milnes, Frank J., to Olin Corporation. Use of poly(oxyalkylated) hydrazines as corrosion inhibitors. 4,317,741, Cl. 252-77.000.
Lee, Derek J.; and Livingstone, James L. C., to Solartron Electronic Group Limited, The. Weapon training systems. 4,317,650, Cl. 434-16.000.
Lee, Sam S.: *See*—
Karayannis, Nicholas M.; and Lee, Sam S., 4,317,898, Cl. 526-141.000.
Lee Turzillo Contracting Company: *See*—
Hightower, Arthur A., 4,317,494, Cl. 175-88.000.
Leibhard, Erich, to Hilti Aktiengesellschaft. Device for the melting and the dose discharge of thermoplastic material. 4,317,529, Cl. 222-146.0HE.
Leighton, David L.; and Phleger, Charles F., to University of California, The Regents of the. Reusable plastic rearing panel applicable to aquaculture. 4,317,429, Cl. 119-2.000.
Leisegang, Lutz. Method and apparatus for dedusting and absorption of contaminating gases being the exhaust gases of waste-incinerating devices and hot-air cupola furnaces. 4,317,806, Cl. 423-242.000.
Le Mehaute, Alain; Rouxel, Jean; and Le Blanc-Soreau, Annie, to Societe Anonyme dite Compagnie Generale D'Electricite. Electric cell with a non-aqueous electrolyte. 4,317,873, Cl. 429-197.000.
Lemmon, Norman F., to Deere & Company. Adjustable wheel assembly. 4,317,596, Cl. 301-1.000.
Lengerman, Larry H.: *See*—
Goodrich, Russell A.; Lengerman, Larry H.; and Timbeross, James K., 4,317,980, Cl. 219-117.100.
Lesher, George Y.; and Page, Donald F., to Sterling Drug Inc. 4-[4(or 3)-Acylaminophenyl]pyridines and their use as cardiotonics. 4,317,827, Cl. 424-263.000.
Lesher, George Y.; and Brundage, Ruth P., to Sterling Drug Inc. Preparation of 1,3-dihydro-5-(pyridinyl)-2H-imidazo[4,5-b]pyridin-2-ones. 4,317,909, Cl. 544-127.000.
Le Veux, Bernard: *See*—
Cottin, Claude; and Le Veux, Bernard, 4,317,582, Cl. 280-751.000.
Levi, Elliott J., to Drew Chemical Corporation. Corrosion inhibitor. 4,317,744, Cl. 252-389.00A.
Levine, Aaron J. Drive attachment for a drain cleaning plumbing tool. 4,317,247, Cl. 15-104.3SN.
Lewarchik, Ronald J.; and Carter, Betty J., to PPG Industries, Inc. Low temperature cure coating compositions. 4,317,894, Cl. 525-455.000.
Lewis, Irwin C.; and Moore, Arthur W., to Union Carbide Corporation. Carbon fiber production using high pressure treatment of a precursor material. 4,317,809, Cl. 423-447.100.
Lewis, Robert T.: *See*—
Hubred, Gale L.; and Lewis, Robert T., 4,317,730, Cl. 210-695.000.
Li, Choh Hao, to Hoffmann-La Roche Inc. D-amino acid analogs of beta-endorphin. 4,317,770, Cl. 260-112.50E.
Li, Chou H. Self-lubricated, high-temperature bearing. 4,317,600, Cl. 308-188.000.
Libbey-Owens-Ford Company: *See*—
Boss, Gerald R.; and Bueno, Alejandro G., 4,317,669, Cl. 65-135.000.
Licentia Patent-Verwaltungs-G.m.b.H.: *See*—
Schroder, Ernst, 4,318,009, Cl. 307-246.000.
Zeis, Jurgen, 4,318,011, Cl. 307-300.000.
Life Savers, Inc.: *See*—
Cherukuri, Subraman R.; and Friello, Dominick R., 4,317,838, Cl. 426-5.000.
Kehoe, Gary; Puglia, Wayne J.; Witzel, Frank; Friello, Dominick R.; and Mackay, Donald A. M., 4,317,837, Cl. 426-3.000.
Liller, Delbert I. Vortex finder and sleeve kit. 4,317,716, Cl. 209-211.000.
Lim, James K.: *See*—
Coppa, Richard J.; Lim, James K.; and Rodriguez, Marie T., 4,317,620, Cl. 354-33.000.
Lindahl, Paul A., Jr.: *See*—
Dickey, Joe B., Jr.; Kuharic, Ivan F.; and Lindahl, Paul A., Jr., 4,317,785, Cl. 261-111.000.
Lindgren, Timothy F., to General Motors Corporation. Internal combustion engine ignition system. 4,317,437, Cl. 123-414.000.
Link, Helmut F.; and Waiblinger, Paul, to Index-Werke KG Hahn & Tessky. Arrangement for loading and unloading workpieces of machine tools. 4,317,394, Cl. 82-2.500.
Lister, Clive R. B. Vibratory ribbon speaker. 4,317,966, Cl. 179-115.00V.

Litton Systems, Inc.: *See—*
Bloom, Gordon E., 4,318,166, Cl. 363-26.000.
Buck, Ronald G., 4,317,977, Cl. 219-10.55B.
Livermore, Malcolm J.; and Hobbs, John C., to Ford Motor Company. Bulbholder and filter assembly. 4,318,158, Cl. 362-29.000.
Livingstone, James L. C.: *See—*
Lee, Derek J.; and Livingstone, James L. C., 4,317,650, Cl. 434-16.000.
Lizee, Dominique: *See—*
Gielly, Jean-Francois; Lizee, Dominique; and Sohier, Bernard, 4,317,807, Cl. 423-320.000.
Logue, Michel: *See—*
Boudeau, Jean-Michel; Logue, Michel; and Parisot, Claude, 4,317,951, Cl. 13-18.00C.
Lombardo, Igino; and Dussault, Richard A., to Ortho Diagnostics, Inc. Servo system to control the spatial position of droplet formation of a fluid jet in a cell sorting apparatus. 4,317,520, Cl. 209-3.100.
Lombardo, John. Musical rhythm pattern generator. 4,317,404, Cl. 84-474.000.
Lonseth, Wayne F.; and Dirk-Hazen, William C., to Esquire, Inc. Lamp, ballast and starter visual monitor. 4,318,031, Cl. 315-133.000.
Louw, Franklin S. Luggage carrier. 4,317,534, Cl. 224-328.000.
Louw, Franklin S., to Mobi-Jack (Proprietary) Limited. Vehicle towing trailer. 4,317,579, Cl. 280-402.000.
Lowe, Daniel: *See—*
Carmon, Amiram; and Lowe, Daniel, 4,317,278, Cl. 29-878.000.
Ludke, Heimo; Gunther, Peter; and Kleimann, Helmut, to Bayer Aktiengesellschaft. Process for the production of non-cellular molded articles. 4,317,791, Cl. 264-297.000.
Ludwig, Richard H.: *See—*
Quan, Wing C.; and Ludwig, Richard H., 4,317,506, Cl. 187-29.00R.
Luedtke, Arthur, to United States of America, FCC. Direction finding system. 4,318,106, Cl. 343-124.000.
Luk Lamellen und Kupplungsbau: *See—*
Kohlhage, Ernst H., 4,317,435, Cl. 123-179.00J.
Lumineau, Yves: *See—*
Faure, Michel; and Lumineau, Yves, 4,317,666, Cl. 65-2.000.
Lundqvist, Inge J.; Pettersson, Jan G. T.; and Fladda, Gerdt H., to Svenska Traforskningsinstitutet. Method and apparatus for indicating the size distribution of particles in a flowing medium. 4,318,180, Cl. 364-555.000.
Lutz, Eugene F., to Shell Oil Company. Preparation of secondary alkanol alkoxylates. 4,317,938, Cl. 568-619.000.
M. Yasui & Co. Ltd.: *See—*
Yasui, Shozui, 4,317,288, Cl. 33-265.000.
MacArthur, John D.: *See—*
Clark, Reginald H.; MacArthur, John D.; Sayer, Michael; and Wilder, William D., 4,317,521, Cl. 209-558.000.
Machida, Toyotaka, to Victor Company of Japan, Limited. Automatic exposure control apparatus for television cameras. 4,318,132, Cl. 358-228.000.
Machinefabriek en Technische Handelsonderneming M. H. Van Der Graaf BV: *See—*
Wiebe, Koning, 4,317,513, Cl. 192-105.00A.
Mackay, Donald A. M.: *See—*
Kehoe, Gary; Puglia, Wayne J.; Witzel, Frank; Friello, Dominick R.; and Mackay, Donald A. M., 4,317,837, Cl. 426-3.000.
MacLennan, David G.; Ousby, John C.; Owen, Terence R.; and Steer, David C., to Imperial Chemical Industries Limited. Microbiological production of protein. 4,317,843, Cl. 426-656.000.
Madsen, Kristian D.: *See—*
Johansson, Sven; Kolsmyr, Roland; Madsen, Kristian D.; and Polvi, Esko, 4,318,021, Cl. 310-260.000.
Maekawa, Kaoru: *See—*
Sasaoka, Ryosuke; Ishino, Yasuo; and Maekawa, Kaoru, 4,317,661, Cl. 55-131.000.
Magnavox Company, The: *See—*
Heuer, Daniel A., 4,318,130, Cl. 358-191.100.
Magness, Preston L.: *See—*
Krupa, John E.; Magness, Preston L.; and Brady, Thomas J., 4,318,045, Cl. 328-18.000.
Magolda, Ronald L.: *See—*
Nicolaou, Kyriacos C.; Magolda, Ronald L.; and Claremon, David A., 4,317,935, Cl. 568-445.000.
Magrath, Joseph M., to Merck & Co., Inc. Piston operated pump for viscous materials. 4,317,530, Cl. 222-309.000.
Mahnke, Parker E.: *See—*
Uyeda, Tim M.; and Mahnke, Parker E., 4,317,566, Cl. 272-118.000.
Mahoney, John F.: *See—*
Perel, Julius; and Mahoney, John F., 4,318,028, Cl. 315-111.810.
Majicek, Stepan; and Fitz, Frank A., to Verbatim Corporation. Waste solvent recovery apparatus. 4,317,722, Cl. 210-149.000.
Makovec, Donald J.; and Haskell, Donald M., to Phillips Petroleum Company. Catalytic alkylation of hydrocarbons. 4,317,795, Cl. 422-62.000.
Mallozzi, Philip J.; Epstein, Harold M.; Schwerzel, Robert E.; and Campbell, Bernerd E., to Battelle Memorial Institute. Laser EXAFS. 4,317,994, Cl. 250-275.000.
Malmberg, Gunnar; Andersson, Roger; and Pettersson, Kjell, to Stiga AB. System for motor-driven ride-on lawn mowers. 4,317,324, Cl. 56-11.300.
Mancini, Giuseppe; Imparato, Luigi; and Berti, Franco, to Snamprogetti S.p.A. Organic ester for use in lubricant compositions. 4,317,780, Cl. 260-410.600.
Mannesmann Aktiengesellschaft: *See—*
Halene, Clemens; Schlichting, Josef; and Strack, Karl, 4,317,348, Cl. 72-62.000.
Mansfield, Peter, to National Research Development Corporation. Methods of indicating nuclear spin density distribution. 4,318,044, Cl. 324-309.000.
Mantegani, Sergio: *See—*
Temperilli, Aldemio; Mantegani, Sergio; Arcari, Giuliana; and Caravaggi, Anna M., 4,317,912, Cl. 546-199.000.
Manville Service Corporation: *See—*
Charlton, Marshall J., 4,317,617, Cl. 350-97.000.
Marchal, Claude; and Van Espen, Christian, to Caterpillar Tractor Co. Rain deflector for door. 4,317,588, Cl. 292-341.140.
Marconi Company Limited, The: *See—*
Dawson, John H., 4,318,047, Cl. 328-112.000.
Mogensen, Gregers E., 4,318,049, Cl. 329-50.000.
Marcy Gymnasium Equipment Co.: *See—*
Uyeda, Tim M.; and Mahnke, Parker E., 4,317,566, Cl. 272-118.000.
Market Products, Inc.: *See—*
Sernovitz, Morton A., 4,317,303, Cl. 40-564.000.
Marley Company, The: *See—*
Dickey, Joe B., Jr.; Kuharic, Ivan F.; and Lindahl, Paul A., Jr., 4,317,785, Cl. 261-111.000.
Marshall, Albert H.; Bond, Gary M.; and Shaw, Bon F., to United States of America, Navy. Weapons training apparatus for simulating long range weapons. 4,317,651, Cl. 434-22.000.
Marshall, Albert H.; Bond, Gary M.; and Shaw, Bon F., to United States of America, Navy. Marksmanship training device for simulating long range weapons. 4,317,652, Cl. 434-22.000.
Marshall, Don J. Anchor. 4,317,423, Cl. 114-297.000.
Marshall, Robert M., to Allied Chemical Corporation. Soil resistant yarn finish for synthetic organic polymer yarn. 4,317,736, Cl. 252-8.750.
Martikainen, Kaarlo; and Piiroinen, Paavo, to Oy Wartsila Ab. Cylinder lock. 4,317,347, Cl. 70-366.000.
Martin, James S.: *See—*
Cordova, Ronald J.; Peters, Edmund J.; and Martin, James S., 4,318,137, Cl. 360-32.000.
Martin, Jean-Francois; and Drouineau, Michel, to Societe Anonyme dite: Ateliers et Chantiers de Bretagne-ACB. Apparatus for revaporizing liquefied gases. 4,317,269, Cl. 29-157.30R.
Martin, Jerry R.; Tadanikr, John S.; and Collum, Paulette, to Abbott Laboratories. 1,2-Epiminofortimicin B. 4,317,904, Cl. 536-17.00R.
Martin-Smith, Michael: *See—*
Clitherow, John W.; Price, Barry J.; Bradshaw, John; and Martin-Smith, Michael, 4,317,819, Cl. 424-244.000.
Marto, John H., to J. I. Case Comany. Timing belt adjustment mechanism. 4,317,325, Cl. 56-11.600.
Maruko, Saburo. Solar heat utilization apparatus. 4,317,444, Cl. 126-438.000.
Marusiak, Wojciech: *See—*
Dohrmann, Rolf; Henke, Ulrich; and Marusiak, Wojciech, 4,318,070, Cl. 337-3.000.
Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See—*
Fuhrmann, Wolfgang, 4,317,433, Cl. 123-90.510.
Maschlanka, Walter: *See—*
Weber, Ralph; Elsner, Emil; Maschlanka, Walter; Rollinger, Bernt; and Sanders, Gerhard, 4,317,677, Cl. 75-43.000.
Mase, Hiroshi: *See—*
Karasawa, Kunihiko; Hosoda, Tokushiro; Mase, Hiroshi; Sato, Yasuo; and Shimada, Shoji, 4,317,845, Cl. 427-47.000.
Masly, John R.: *See—*
Goes, Michael J.; and Masly, John R., 4,317,373, Cl. 73-787.000.
Mason, Carl J.: *See—*
Klayman, Daniel L.; Scovill, John P.; Bartosevich, Joseph F.; Mason, Carl J.; and Griffin, T. Scott, 4,317,776, Cl. 260-244.400.
Massardo, Pietro; Cassani, Giorgio; and Piccardi, Paolo, to Montedison S.p.A. Preparation of compounds containing two conjugated double bonds cis-cis and cis-trans. 4,317,905, Cl. 542-413.000.
Massetti, Alessandro. Toothbrush structure. 4,317,463, Cl. 132-84.00R.
Masuda, Masafumi: *See—*
Ogura, Toshimasa; and Masuda, Masafumi, 4,317,849, Cl. 427-362.000.
Masuda, Youichi: *See—*
Onodera, Toshihiro; Masuda, Youichi; and Nakajima, Akira, 4,318,164, Cl. 363-21.000.
Matchette, Gerald J. Saw guide clamping assembly. 4,317,400, Cl. 83-820.000.
Mathers, Harry. Ice scraper. 4,317,298, Cl. 37-41.000.
Matsushita Electric Industrial Co., Ltd.: *See—*
Fukuda, Shin; and Hirashima, Masayoshi, 4,318,127, Cl. 358-147.000.
Kaminaka, Nobuyuki; Kanai, Kenji; Nouchi, Norimoto; and Nomura, Noboru, 4,318,148, Cl. 360-127.000.
Kureha, Takeshi, 4,318,032, Cl. 315-368.000.
Minakuchi, Hiroshi, 4,318,012, Cl. 307-360.000.
Mizukawa, Takumi; Amagami, Keizo; Kiuchi, Mitsuyuki; Yoshida, Hirokazu; and Saka, Tatsuo, 4,317,975, Cl. 219-10.49R.
Sasaoka, Ryosuke; Ishino, Yasuo; and Maekawa, Kaoru, 4,317,661, Cl. 55-131.000.
Matsushita, Shigeo: *See—*
Lang, Hi-Roy-Oshi; and Matsushita, Shigeo, 4,318,059, Cl. 372-47.000.
Mito, Ikuo; Matsushita, Shigeo; and Kobayashi, Kohroh, 4,318,058, Cl. 372-50.000.

Matsuyama, Iwao: *See*—
Susa, Kenzo; Matsuyama, Iwao; Satoh, Shin; and Suganuma, Tsuneo, 4,317,668, Cl. 65-29.000.
McAlister, Doyle V.; and Pfiester, James R., to Motorola, Inc. Selective precharge circuit for read-only-memory. 4,318,014, Cl. 307-463.000.
McCaffrey, Eugene F.: *See*—
Torok, John; McCaffrey, Eugene F.; Riem, Roland H.; and Cheung, Wing S., 4,317,748, Cl. 252-472.000.
McCarter, Ed R.: *See*—
Thatcher, Arthur K.; and McCarter, Ed R., 4,317,440, Cl. 123-590.000.
McDiarmid, Harry P.; and Mihelich, Peter J., to Grumman Aerospace Corporation. Stripper tool. 4,317,283, Cl. 30-164.900.
McDonald, Peter, to Firestone Tire & Rubber Company, The. Addition members for rubber articles. 4,317,479, Cl. 152-353.00R.
McElroy, John W. Acoustic emission warning system for a fiberglass member. 4,317,368, Cl. 73-587.000.
McGreevy, Roy. Signs. 4,318,098, Cl. 340-764.000.
McIntyre, James A.; and Phillips, Robert F., to Dow Chemical Company, The. Method of operating an electrolytic cell. 4,317,704, Cl. 204-1.00R.
McLean, John R., to Reynolds Metals Company. Sealing mechanism. 4,317,697, Cl. 156-583.100.
McMillan, Robert E. Emergency braking system. 4,317,507, Cl. 188-5.000.
McMullan, James P.; Stevens, Albert; and Metzgar Kenneth J., to Western Control Equipment Co. Transducer. 4,318,016, Cl. 310-19.000.
McPherson, Mathew, Sr. Acoustic guitar. 4,317,402, Cl. 84-291.000.
McVay, William P.: *See*—
Cerwin, Robert J.; and McVay, William P., 4,317,451, Cl. 128-325.000.
Mead Corporation, The: *See*—
Huliba, David A., 4,318,114, Cl. 346-140.00R.
Mechanische Weberei GmbH: *See*—
Meinunger, Helmut, 4,317,553, Cl. 248-171.000.
Mecklenbrauker, Wolfgang F. G.: *See*—
Peek, Johannes B. H.; Mecklenbrauker, Wolfgang F. G.; Claasen, Theodoor A. C. M.; and van Hurck, Nicolaas, 4,318,086, Cl. 340-347.0AD.
Medtronic, Inc.: *See*—
Gilman, Byron L., 4,317,459, Cl. 128-785.000.
Meinunger, Helmut, to Mechanische Weberei GmbH. Projection screen stand. 4,317,553, Cl. 248-171.000.
Meissner Manufacturing Company, Inc.: *See*—
Meissner, Paul J., 4,317,727, Cl. 210-315.000.
Meissner, Paul J., to Meissner Manufacturing Company, Inc. Fluid filter cartridge and method of its construction. 4,317,727, Cl. 210-315.000.
Mellerowicz, Ryszard, to Kombinat Produkcji i Montazu Obiektow Budownictwa Ogolnego z Lekkich Konstrukcji Stalowych "Metalplast". Method of sewageless metallization, especially galvanizing of a steel surface. 4,317,848, Cl. 427-309.000.
Melton, Florence. Slipper sock and method of manufacture. 4,317,292, Cl. 36-9.00R.
Melville, Douglas K.: *See*—
Schuessler, Thomas F.; and Melville, Douglas K., 4,317,525, Cl. 215-1.00C.
Menting, James E., to Quaker Oats Company, The. Catalysts and binder systems for manufacturing sand shapes. 4,317,763, Cl. 523-144.000.
Merck & Co., Inc.: *See*—
Bertland, Alexander U.; and Lampson, George P., 4,317,811, Cl. 424-89.000.
Cragoe, Edward J., Jr.; Stokker, Gerald E.; and Gould, Norman P., 4,317,922, Cl. 562-461.000.
Magrath, Joseph M., 4,317,530, Cl. 222-309.000.
Woltersdorf, Otto W., Jr.; and Cragoe, Edward J., Jr., 4,317,822, Cl. 424-249.000.
Merkl, George G., to Molecular Energy Research Company, Inc. Method of recovering oil and other hydrocarbon values from subterranean formations. 4,317,487, Cl. 166-305.00R.
Mesa Industries, Inc.: *See*—
Swain, Fredrick O.; and Decker, Raymond E., 4,317,528, Cl. 220-224.000.
Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung: *See*—
Grawe, Helmut; and Petters, Claus, 4,317,414, Cl. 102-406.000.
Metallumform Hubert Eing: *See*—
Stell, Karl-Wilhelm, 4,317,356, Cl. 72-355.000.
Metaux Speciaux: *See*—
Dugua, Jacques, 4,317,802, Cl. 423-55.000.
Metcalf, Brian W.: *See*—
Blohm, Thomas R.; and Metcalf, Brian W., 4,317,817, Cl. 424-226.000.
Metzgar Kenneth J.: *See*—
McMullan, James P.; Stevens, Albert; and Metzgar Kenneth J., 4,318,016, Cl. 310-19.000.
Metzger, Lenard M., to Eastman Kodak Company. Exposure control apparatus for flash photography. 4,317,622, Cl. 354-34.000.
Meyer, Hartmut, to Siemens Aktiengesellschaft. Winding of an electric machine. 4,318,020, Cl. 310-215.000.
Michel, Edmond: *See*—
Hubert, Guy; and Michel, Edmond, 4,317,793, Cl. 264-521.000.
Micro Power Systems, Inc.: *See*—
Hall, John H., 4,318,118, Cl. 357-54.000.
Middleton, Thomas: *See*—
Strandli, Kare R.; Middleton, Thomas; and Fjeldstad, Jarle, 4,317,413, Cl. 102-275.900.
Migeon, Jean P.; and Poix, Claude, to Timex Corporation. Rotor assembly for electric stepping motor. 4,318,017, Cl. 310-42.000.
Mihelich, Peter J.: *See*—
McDiarmid, Harry P.; and Mihelich, Peter J., 4,317,283, Cl. 30-164.900.
Miklavcic, Joze: *See*—
Zupancic, Viktor; and Miklavcic, Joze, 4,317,634, Cl. 366-1.000.
Milberger, Lionel J.; Denk, Eddie W.; and Hostrup, Kai R., to Texas A & M University System. Apparatus and method for obtaining a core at in situ pressure. 4,317,490, Cl. 175-20.000.
Miller, Cardell E.; Folley, Robert F.; and Larson, Ralph H., to Nordson Corporation. Liquid filling and level sensing apparatus. 4,317,475, Cl. 141-95.000.
Miller, Donald S. Steel reinforced concrete piles. 4,317,643, Cl. 405-256.000.
Miller, Sammy L., to General Electric Company. End turn and terminal support for a stator assembly. 4,318,022, Cl. 310-260.000.
Miller, Wayne R., to Deere & Company. Vehicle emergency steering system. 4,317,499, Cl. 180-133.000.
Millett, Ronald P.; and Allen, Dell K. Information storage and retrieval system and method. 4,318,184, Cl. 364-900.000.
Milnes, Frank J.: *See*—
Lederle, Henry F.; and Milnes, Frank J., 4,317,741, Cl. 252-77.000.
Minakuchi, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Input signal processing circuit formed as an integrated circuit. 4,318,012, Cl. 307-360.000.
Miner, Robert C.: *See*—
Scarnato, Thomas J.; Hoch, Manfried L.; and Miner, Robert C., 4,317,580, Cl. 280-415.00R.
Minnesota Mining and Manufacturing Company: *See*—
Cowles, Arthur L.; and Ensign, Thomas C., 4,318,092, Cl. 340-636.000.
Huftel, Terrance D.; Odegaard, Lester B.; and Rasmussen, Thomas K., 4,317,535, Cl. 227-19.000.
Von De Linde, Dennis J., 4,317,302, Cl. 40-549.000.
Missana, Adrian: *See*—
Kure-Jensen, Jens; and Missana, Adrian, 4,318,179, Cl. 364-506.000.
Mitchell, John F.: *See*—
Wood, Robert J.; and Mitchell, John F., 4,318,093, Cl. 340-644.000.
Mitchell, William A.; Wasserman, Gerald S.; and Glatz, Alfred C., to General Foods Corporation. Taffy-like confection composition. 4,317,839, Cl. 426-96.000.
Mito, Ikuo; Matsushita, Shigeo; and Kobayashi, Kohroh, to Nippon Electric Co., Ltd. Semiconductor diode laser array. 4,318,058, Cl. 372-50.000.
Mitrofanov, Vladimir E.: *See*—
Chubarov, Evgeny P.; Kubyshkin, Viktor A.; Mitrofanov, Vladimir E.; Emelyanov, Alexandr N.; Butkovsky, Anatoly G.; Norkin, Kemer B.; Aizenshtein, Anatoly G.; Kolomeitseva, Margarita B.; Suvorov, Arthur M.; and Vazhnov, Sergei A., 4,317,981, Cl. 219-121.0EA.
Mitsubishi Paper Mills, Ltd.: *See*—
Ogura, Toshimasa; and Masuda, Masafumi, 4,317,849, Cl. 427-362.000.
Mitsui, Sadao; Takahashi, Minoru; and Watanabe, Keiichi, to TDK Electronics Co., Ltd. Ultrasonic wave nebulizer driving circuit. 4,318,062, Cl. 331-109.000.
Miura, Tatsuo: *See*—
Tanabe, Zenichi; Fukui, Toshiyasu; Ikeda, Hiroshi; Miura, Tatsuo; and Sugiura, Taketoshi, 4,317,484, Cl. 165-134.00R.
Miyashita, Osamu; and Akimoto, Hiroshi, to Takeda Chemical Industries, Ltd. Maytansinoids, their use and pharmaceutical compositions thereof. 4,317,821, Cl. 424-248.540.
Mizokami, Kazunori, to Olympus Optical Co., Ltd. Exposure control apparatus for use with a camera having electronic flash controlling capability. 4,317,621, Cl. 354-33.000.
Mizukawa, Takumi; Amagami, Keizo; Kiuchi, Mitsuyuki; Yoshida, Hirokazu; and Saka, Tatsuo, to Matsushita Electric Industrial Co., Ltd. Induction heating apparatus with means for detecting zero crossing point of high-frequency oscillation to determine triggering time. 4,317,975, Cl. 219-10.49R.
Mobay Chemical Corporation: *See*—
Eppler, Richard A., 4,317,683, Cl. 106-292.000.
Mobi-Jack (Proprietary) Limited: *See*—
Louw, Franklin S., 4,317,579, Cl. 280-402.000.
Mobil Oil Corporation: *See*—
Chen, Catherine S. H.; and Sheppard, Edward W., 4,317,893, Cl. 525-328.000.
Farcasiu, Malvina, 4,317,712, Cl. 208-46.000.
Yan, Tsoung Y., 4,317,711, Cl. 208-8.0LE.
Mobil Tyco Solar Energy Corporation: *See*—
Serafino, John B.; and Kmetz, William A., 4,317,799, Cl. 422-249.000.
Mocella, Michael T.: *See*—
Taylor, Paul D.; and Mocella, Michael T., 4,317,801, Cl. 423-54.000.
Mode, Duane R., to Champion International Corporation. Carton with reclosable spout and blank therefor. 4,317,518, Cl. 206-626.000.
Model, Ernst, to Ciba-Geigy Corporation. Tetraphenylketazines and isoindolinone pigments obtained therefrom. 4,317,929, Cl. 564-249.000.
Moen, Jerry. Jet orifice reducer. 4,317,357, Cl. 72-438.000.

Mogensen, Gregers E., to Marconi Company Limited, The. Carrier recovery circuit for use in a multi-level phase shift keying demodulator. 4,318,049, Cl. 329-50.000.

Molecular Energy Research Company, Inc.: *See*—
Merkl, George G., 4,317,487, Cl. 166-305.00R.

Momonoi, Kaishu: *See*—
Saikawa, Isamu; Takano, Shuntaro; Momonoi, Kaishu; Takakura, Isamu; Kuroda, Seietsu; Tanaka, Kiyoshi; Hayashi, Kenshin; Nagahashi, Bunei; and Kutani, Chiaki, 4,317,907, Cl. 544-21.000.

Monsanto Company: *See*—
Bollinger, Frederic G., 4,317,310, Cl. 47-57.600.
Hinderer, Helmuth E., 4,317,902, Cl. 528-337.000.
Smith, Andrew L., 4,317,859, Cl. 428-389.000.

Montedison S.p.A.: *See*—
Di Battista, Piero; and Gratani, Francesco, 4,317,767, Cl. 524-102.000.
Massardo, Pietro; Cassani, Giorgio; and Piccardi, Paolo, 4,317,905, Cl. 542-413.000.

Moore, Arthur W.: *See*—
Lewis, Irwin C.; and Moore, Arthur W., 4,317,809, Cl. 423-447.100.

Morioka, Yoshihiro: *See*—
Nakamura, Takashi; and Morioka, Yoshihiro, 4,318,124, Cl. 358-51.000.

Morishita, Teru; and Fukuda, Daiki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Fuel injector. 4,317,542, Cl. 239-585.000.

Morita, Koichi: *See*—
Aruga, Taketo; and Morita, Koichi, 4,317,331, Cl. 60-436.000.

Morse, John B., to Polaroid Corporation. Bobbin with terminal block designed for machine wrap. 4,318,069, Cl. 336-192.000.

Morton, Edward W.: *See*—
Dooley, Thomas E.; and Morton, Edward W., 4,318,160, Cl. 362-216.000.

Mostek Corporation: *See*—
Dozier, Harold W., 4,317,275, Cl. 29-571.000.

Motor Wheel Corporation: *See*—
Golata, John H.; and Kinstler, John R., 4,317,597, Cl. 301-63.00R.

Motorola, Inc.: *See*—
McAlister, Doyle V.; and Pfiester, James R., 4,318,014, Cl. 307-463.000.
Thomas, James S.; and Eckert, Kim, 4,318,013, Cl. 307-362.000.

Muhlbaier, John P.: *See*—
Hopwood, Francis W.; Muhlbaier, John P.; Oakes, Jeffrey T.; and Haynes, James T., 4,318,055, Cl. 331-12.000.

Muller, Karl-Heinz: *See*—
Krude, Werner; and Muller, Karl-Heinz, 4,317,340, Cl. 64-17.00A.

Muller, Reinhard: *See*—
Oberlander, Gerhard; Muller, Reinhard; and Funke, Werner, 4,317,379, Cl. 73-863.120.

Munehiro, Hidehiko, to Nippon Electric Co., Ltd. Moving-coil linear motor. 4,318,038, Cl. 318-135.000.

Murakawa, Tetsuya; and Kaneko, Toshimi, to Murata Manufacturing Co., Ltd. RC Composite component with spark gap. 4,318,149, Cl. 361-15.000.

Murakoshi, Makoto, to Fuji Photo Film Co., Ltd. Vibrating screen for image projection. 4,317,618, Cl. 350-120.000.

Murase, Hidetoshi: *See*—
Watanabe, Tsuyoshi; Murase, Hidetoshi; Murayama, Akira; and Nakasugi, Mikio, 4,317,270, Cl. 29-447.000.

Murata Manufacturing Co., Ltd.: *See*—
Murakawa, Tetsuya; and Kaneko, Toshimi, 4,318,149, Cl. 361-15.000.

Murayama, Akira: *See*—
Watanabe, Tsuyoshi; Murase, Hidetoshi; Murayama, Akira; and Nakasugi, Mikio, 4,317,270, Cl. 29-447.000.

Musha, Toshimitsu; Sekine, Matsuo; Kiuchi, Eichi; and Irabu, Takeru, to Nippon Electric Co., Ltd. MTI Radar comprising a processor selectively operable as a Weibull and a Rayleigh clutter suppressor. 4,318,101, Cl. 343-5.0CF.

Mustard, Jack L., to Phillips Petroleum Company. Liquid sampling apparatus. 4,317,378, Cl. 73-863.010.

Myers, Ronald I.; and Rader, Charles W., to General Motors Corporation. Telescoping steering assembly. 4,317,387, Cl. 74-493.000.

Mynett, Thomas M.: *See*—
Stratton, Larry J.; Norini, Richard A.; Davis, Peter G.; Dyskievicz, Steve M.; Cowap, Frederic W.; Haskin, Roger L.; Gagner, Mark B.; and Mynett, Thomas M., 4,318,176, Cl. 364-469.000.

N. P. Marketing Corporation: *See*—
Van Gompel, James J., 4,317,645, Cl. 410-94.000.

Nagae, Michio: *See*—
Tsuda, Katsuhiro; Tanaka, Hisao; Nagae, Michio; and Imanaga, Yasuhikó, 4,317,760, Cl. 524-111.000.

Nagahashi, Bunei: *See*—
Saikawa, Isamu; Takano, Shuntaro; Momonoi, Kaishu; Takakura, Isamu; Kuroda, Seietsu; Tanaka, Kiyoshi; Hayashi, Kenshin; Nagahashi, Bunei; and Kutani, Chiaki, 4,317,907, Cl. 544-21.000.

Nagai, Fuyuki: *See*—
Ikeda, Akinori; Nagai, Fuyuki; and Okuno, Takashi, 4,317,466, Cl. 137-115.000.

Nagase, Osamu: *See*—
Shiba, Tetsuo; Kotani, Shozo; Yamamura, Yuichi; Nagase, Osamu; and Ogawa, Hidemasa, 4,317,771, Cl. 260-112.50R.

Nagel, Hartmut: *See*—
Zimmerman, Hans; Piper, Fritz; Wierth, Gerd; and Nagel, Hartmut, 4,317,563, Cl. 271-211.000.

Naito, Kazuo: *See*—
Honda, Toshio; Tanuma, Itsuo; Ogawa, Masao; Ishikawa, Hikaru; Fukuura, Yukio; Akiyama, Setsuo; Ojima, Shozo; and Naito, Kazuo, 4,317,862, Cl. 428-442.000.

Nakagawa, Kazuyuki: *See*—
Ishikawa, Hiroshi; Tabusa, Fujio; and Nakagawa, Kazuyuki, 4,317,820, Cl. 424-246.000.

Nakagawa, Noboru; Oonishi, Toshiyuki; Tsutsumi, Masato; and Kawamoto, Akira, to Tokyo Shibaura Denki Kabushiki Kaisha. Refrigerating apparatus. 4,317,335, Cl. 62-199.000.

Nakajima, Akira: *See*—
Onodera, Toshihiro; Masuda, Youichi; and Nakajima, Akira, 4,318,164, Cl. 363-21.000.

Nakajima, Takato, to Kanetsu Kogyo Kabushiki Kaisha. Nonmagnetic conductive material separating apparatus. 4,317,717, Cl. 209-212.000.

Nakamura, Takashi, to Sony Corporation. Beam current control circuit. 4,318,034, Cl. 315-383.000.

Nakamura, Takashi; and Morioka, Yoshihiro, to Sony Corporation. Automatic registration system. 4,318,124, Cl. 358-51.000.

Nakanishi, Toru; and Shigemasa, Yoshimi, to Kyowa Hakko Kogyo Co., Ltd. Test composition containing acidic uricase used for quantitative determination of uric acid in sample. 4,317,878, Cl. 435-10.000.

Nakasugi, Mikio: *See*—
Watanabe, Tsuyoshi; Murase, Hidetoshi; Murayama, Akira; and Nakasugi, Mikio, 4,317,270, Cl. 29-447.000.

Nakayama, Michio. Bottle opener. 4,317,390, Cl. 81-3.200.

Nakazawa, Kenichi: *See*—
Kawakami, Ryuichi; and Nakazawa, Kenichi, 4,318,181, Cl. 364-569.000.

Nall, Joseph E., to J. N. Engineering, Inc. Random power controller. 4,318,008, Cl. 307-84.000.

Narlow, Douglas A.; and Stevens, Eugene, to Sensormatic Electronics Corporation. Apparatus for deactivating a surveillance tag. 4,318,090, Cl. 340-572.000.

Naruse, Tunehide: *See*—
Nishihara, Toshikazu; Isono, Hiromasa; Naruse, Tunehide; Ozaki, Sadao; and Takahashi, Noboru, 4,317,675, Cl. 75-0.5BA.

Nasica, Jean R. L.: *See*—
Torterotot, Roland M.; and Nasica, Jean R. L., 4,317,321, Cl. 53-426.000.

National Machinery Company, The: *See*—
Wisebaker, Dale A., 4,317,354, Cl. 72-339.000.

National Research Development Corporation: *See*—
Anand, Kranti V.; and Butcher, John B., 4,317,686, Cl. 148-1.500.
Mansfield, Peter, 4,318,044, Cl. 324-309.000.

Nauheimer, James F., to Container Corporation of America. Partition structure. 4,317,537, Cl. 229-42.000.

Naumann, Klaus: *See*—
Fuchs, Rainer; Naumann, Klaus; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; and Stendel, Wilhelm, 4,317,834, Cl. 424-304.000.

NCR Canada Ltd - NCR Canada Ltee: *See*—
King, John T., 4,318,082, Cl. 340-146.30H.

Near Field Technology Co.: *See*—
Yukl, Tex N., 4,318,108, Cl. 343-753.000.

Nebesar, George C., to Park-Ohio Industries, Inc. Induction heater arrangement for forging bar stock. 4,317,978, Cl. 219-10.710.

Nelligan, William B.: *See*—
Hertzog, Russel C., Jr.; and Nelligan, William B., 4,317,993, Cl. 250-270.000.

Nelson, Leonard Y.: *See*—
Buchwald, Melvin I.; Jones, Claude R.; and Nelson, Leonard Y., 4,318,057, Cl. 372-70.000.

Neser, Rudolf P., to Woellner-Werke. Method for spray applying an insulating coating to metallic or non-metallic objects. 4,317,851, Cl. 427-426.000.

New York Institute of Technology: *See*—
Glenn, William E., 4,317,370, Cl. 73-620.000.

Newman, Caroline; and Spector, George. Truck bed unloading device. 4,317,592, Cl. 298-7.000.

Nicholas, Mark L.: *See*—
Blum, Patricia R.; and Nicholas, Mark L., 4,317,778, Cl. 260-346.750.

Nickols, Richard C., Jr.: *See*—
Trocciola, John C.; and Nickols, Richard C., Jr., 4,317,866, Cl. 429-41.000.

Nicolaou, Kyriacos C.; Magolda, Ronald L.; and Claremon, David A., to Research Corporation. Bicyclo aldehyde and process for preparation. 4,317,935, Cl. 568-445.000.

Niconchuk, Alec W. Inside repair for tubeless tire and method for applying same. 4,317,692, Cl. 156-97.000.

Niebylski, Leonard M., to Ethyl Corporation. Gasoline additive fluids to reduce hydrocarbon emissions. 4,317,657, Cl. 44-66.000.

Nifty Enterprises, Inc.: *See*—
Timphony, Harold R.; and DeCastro, Rene F., 4,317,301, Cl. 38-102.000.

Nigrelli, Biagio J., to Johns-Nigrelli-Johns, Inc. In-line carton slitting, flap folding and flap gluing apparatus. 4,317,320, Cl. 53-374.000.

Nihon Parkerizing Co.: *See*—
Karasawa, Kunihiko; Hosoda, Tokushiro; Mase, Hiroshi; Sato, Yasuo; and Shimada, Shoji, 4,317,845, Cl. 427-47.000.

Nihon Technical Kabushiki Kaisha: *See*—
Ohashi, Tamaki, 4,317,381, Cl. 74-10.330.

Nihon Tokushu Noyaku Seizo K.K.: *See*—
Saito, Junichi; and Kume, Toyohiko, 4,317,937, Cl. 568-488.000.

Nippon Electric Co., Ltd.: *See*—
Lang, Hi-Roy-Oshi; and Matsushita, Shigeo, 4,318,059, Cl. 372-47.000.
Mito, Ikuo; Matsushita, Shigeo; and Kobayashi, Kohroh, 4,318,058, Cl. 372-50.000.
Munehiro, Hidehiko, 4,318,038, Cl. 318-135.000.
Musha, Toshimitsu; Sekine, Matsuo; Kiuchi, Eichi; and Irabu, Takeru, 4,318,101, Cl. 343-5.0CF.
Oura, Toshio, 4,318,097, Cl. 340-728.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Yokoyama, Kenji, 4,318,054, Cl. 330-302.000.
Nippon Kayaku Kabushiki Kaisha: *See*—
Katsuta, Takeshi; Ikeda, Yoshiyuki; and Inoue, Atsuo, 4,317,691, Cl. 149-2.000.
Nippon Oil Co., Ltd.: *See*—
Hara, Hajime; Orii, Shingo; and Araki, Yoshihiko, 4,317,754, Cl. 525-501.500.
Tsuchiya, Shozo; Sasaki, Makoto; and Hayashi, Hideo, 4,317,753, Cl. 524-504.000.
Nippon Shokubai Kagaku Kogyo Co., Ltd.: *See*—
Sato, Takahisa; Baba, Masao; and Okane, Michito, 4,317,926, Cl. 562-532.000.
Nippon Soken, Inc.: *See*—
Kato, Yoji, 4,317,434, Cl. 123-145.00A.
Noguchi, Masaaki; Tanaka, Yukiyasu; and Tanaka, Taro, 4,317,432, Cl. 123-1.00R.
Nippon Steel Corporation: *See*—
Souma, Hideaki; Konno, Norimitsu; Hosotani, Yohzoh; and Shibata, Jyuzo, 4,317,676, Cl. 75-5.000.
Nippondenso Co., Ltd.: *See*—
Tanabe, Zenichi; Fukui, Toshiyasu; Ikeda, Hiroshi; Miura, Tatsuo; and Sugiura, Taketoshi, 4,317,484, Cl. 165-134.00R.
Nishihara, Toshikazu; Isono, Hiromasa; Naruse, Tunehide; Ozaki, Sadao; and Takahashi, Noboru, to Victor Company of Japan, Limited. Magnetic iron powder containing molybdenum. 4,317,675, Cl. 75-0.5BA.
Nishina, Yasuhide: *See*—
Imada, Kiyoshi; Ueno, Susumu; Nishina, Yasuhide; and Nomura, Hirokazu, 4,317,788, Cl. 264-22.000.
Nishino, Taizou: *See*—
Okuhara, Mitsuhiko; Nishino, Taizou; Kawamura, Kazuo; and Aoki, Toshiaki, 4,318,131, Cl. 358-210.000.
Nissan Engineering Ltd.: *See*—
Hamada, Sumio; Usui, Kenji; and Noguchi, Takeshi, 4,317,705, Cl. 204-1.00T.
Nissan Motor Company, Limited: *See*—
Asano, Masaharu; and Kanegae, Hidetoshi, 4,317,364, Cl. 73-117.300.
Himeno, Yoshiharu; and Kubota, Masaki, 4,318,006, Cl. 307-38.000.
Kita, Toru, 4,317,361, Cl. 73-30.000.
Nitta, Etsurou: *See*—
Kobayashi, Takashi; and Nitta, Etsurou, 4,317,633, Cl. 356-371.000.
Nitto Kagaku Kogyo Kabushiki Kaisha: *See*—
Kanda, Shoichi; Oda, Toshikazu; Tanabe, Yasunosuke; and Arai, Takeshi, 4,317,759, Cl. 524-93.000.
Nixdorf Computer Corporation, The: *See*—
Abbott, Warwick R., 4,318,039, Cl. 323-273.000.
Nobusawa, Tsukumo, to Asahi Kogaku Kohyo Company Limited. Memory used in automatic exposure control mechanism. 4,317,623, Cl. 354-60.00A.
Noda, Tomimitsu, to Tokyo Shibaura Denki Kabushiki Kaisha. High frequency heating apparatus. 4,317,976, Cl. 219-10.55F.
Noel, David A.: *See*—
Armor, Anthony F.; Archibald, James B.; and Noel, David A., 4,317,952, Cl. 174-15.0BH.
Noguchi, Masaaki; Tanaka, Yukiyasu; and Tanaka, Taro, to Nippon Soken, Inc. Two-cycle internal combustion engine. 4,317,432, Cl. 123-1.00R.
Noguchi, Takeshi: *See*—
Hamada, Sumio; Usui, Kenji; and Noguchi, Takeshi, 4,317,705, Cl. 204-1.00T.
Nomura, Hirokazu: *See*—
Imada, Kiyoshi; Ueno, Susumu; Nishina, Yasuhide; and Nomura, Hirokazu, 4,317,788, Cl. 264-22.000.
Nomura, Noboru: *See*—
Kaminaka, Nobuyuki; Kanai, Kenji; Nouchi, Norimoto; and Nomura, Noboru, 4,318,148, Cl. 360-127.000.
Nomura, Shigenori, to Sony Corporation. Magnetic card recording and/or reproducing apparatus. 4,318,147, Cl. 360-119.000.
Nordson Corporation: *See*—
Miller, Cardell E.; Folley, Robert F.; and Larson, Ralph H., 4,317,475, Cl. 141-95.000.
Noren, Tore H. Tray lock conveyor for dishwashing machines. 4,317,514, Cl. 198-649.000.
Norini, Richard A.: *See*—
Stratton, Larry J.; Norini, Richard A.; Davis, Peter G.; Dyskievicz, Steve M.; Cowap, Frederic W.; Haskin, Roger L.; Gagner, Mark B.; and Mynett, Thomas M., 4,318,176, Cl. 364-469.000.
Norkin, Kemer B.: *See*—
Chubarov, Evgeny P.; Kubyshkin, Viktor A.; Mitrofanov, Vladimir E.; Emelyanov, Alexandr N.; Butkovsky, Anatoly G.; Norkin, Kemer B.; Aizenshtein, Anatoly G.; Kolomeitseva, Margarita B.; Suvorov, Arthur M.; and Vazhnov, Sergei A., 4,317,981, Cl. 219-121.0EA.
North American Philips Consumer Electronics Corp.: *See*—
Penird, Carl W.; and Tamburrino, Richard A., 4,318,025, Cl. 313-404.000.
Northern Telecom Limited: *See*—
Kuhfus, Gerd, 4,317,968, Cl. 200-5.00R.
Roberge, Jean M., 4,317,329, Cl. 57-294.000.
Nouchi, Norimoto: *See*—
Kaminaka, Nobuyuki; Kanai, Kenji; Nouchi, Norimoto; and Nomura, Noboru, 4,318,148, Cl. 360-127.000.
Novell, Bruce J.: *See*—
Bowden, Donald R.; and Novell, Bruce J., 4,317,268, Cl. 29-157.3AH.
Novelty Manufacturing Company: *See*—
Winger, Timothy M., 4,317,554, Cl. 248-205.00A.
Nowakoski, John C., to Warner-Lambert Company. Disposable adult incontinent brief. 4,317,449, Cl. 128-287.000.
Nozaki, Akira, to Clarion Co., Ltd. Switch protecting and adjusting arrangement. 4,317,974, Cl. 200-330.000.
Oakes, Jeffrey T.: *See*—
Hopwood, Francis W.; Muhlbaier, John P.; Oakes, Jeffrey T.; and Haynes, James T., 4,318,055, Cl. 331-12.000.
Oberkirch, Wolfgang: *See*—
Goyert, Wilhelm; Awater, Albert; Grimm, Wolfgang; Ott, Karl-Heinz; Oberkirch, Wolfgang; and Wagner, Hans, 4,317,890, Cl. 525-66.000.
Oberlander, Gerhard; Muller, Reinhard; and Funke, Werner, to Veb Gaskombinat Schwarze Pumpe. Process and apparatus for the continuous withdrawal of specimens from a current of a crude gas for purposes of gas analysis. 4,317,379, Cl. 73-863.120.
Oborin, Gennady A.: *See*—
Khoroshavin, Anatoly N.; Kataeva, Irina V.; Oborin, Gennady A.; and Krasavin, Alexandr P., 4,317,670, Cl. 71-6.000.
Oda, Toshikazu: *See*—
Kanda, Shoichi; Oda, Toshikazu; Tanabe, Yasunosuke; and Arai, Takeshi, 4,317,759, Cl. 524-93.000.
Odegaard, Lester B.: *See*—
Huftel, Terrance D.; Odegaard, Lester B.; and Rasmussen, Thomas K., 4,317,535, Cl. 227-19.000.
Oellerich, Bruce A., to Gould Inc. Battery termination structure. 4,317,870, Cl. 429-161.000.
Ogawa, Hidemasa: *See*—
Shiba, Tetsuo; Kotani, Shozo; Yamamura, Yuichi; Nagase, Osamu; and Ogawa, Hidemasa, 4,317,771, Cl. 260-112.50R.
Ogawa, Masao: *See*—
Honda, Toshio; Tanuma, Itsuo; Ogawa, Masao; Ishikawa, Hikaru; Fukuura, Yukio; Akiyama, Setsuo; Ojima, Shozo; and Naito, Kazuo, 4,317,862, Cl. 428-442.000.
Ogden, Ralph. Label assembly with label end finger hold arrangement. 4,317,852, Cl. 428-40.000.
Ogura, Toshimasa; and Masuda, Masafumi, to Mitsubishi Paper Mills, Ltd. Process for producing high-gloss coated paper. 4,317,849, Cl. 427-362.000.
Ohashi, Tamaki, to Nihon Technical Kabushiki Kaisha. Pushbutton tuner. 4,317,381, Cl. 74-10.330.
Ohishi, Hiroyuki: *See*—
Saito, Toranosuke; and Ohishi, Hiroyuki, 4,317,769, Cl. 524-117.000.
Ohshima, Shoichi: *See*—
Ida, Shiuichiro; Ohshima, Shoichi; and Hirashima, Shunichi, 4,317,386, Cl. 74-467.000.
Ohta, Ken-Ichiro: *See*—
Iino, Kinzo; Ohta, Ken-Ichiro; and Aibe, Hiroshi, 4,318,110, Cl. 346-32.000.
Ohtake, Yoshichi, to Victor Company of Japan, Ltd. Simplified type television camera. 4,318,133, Cl. 358-229.000.
Ojima, Shozo: *See*—
Honda, Toshio; Tanuma, Itsuo; Ogawa, Masao; Ishikawa, Hikaru; Fukuura, Yukio; Akiyama, Setsuo; Ojima, Shozo; and Naito, Kazuo, 4,317,862, Cl. 428-442.000.
Okada, Yoshimaro: *See*—
Hatsuno, Hiroshi; and Okada, Yoshimaro, 4,317,355, Cl. 72-342.000.
Okane, Michito: *See*—
Sato, Takahisa; Baba, Masao; and Okane, Michito, 4,317,926, Cl. 562-532.000.
Okanobu, Taiwa, to Sony Corporation. AM Detecting circuit. 4,318,050, Cl. 329-101.000.
OKI Electric Industry Co., Ltd.: *See*—
Kuriki, Shigeya, 4,317,959, Cl. 179-1.0VC.
Okuhara, Mitsuhiko; Nishino, Taizou; Kawamura, Kazuo; and Aoki, Toshiaki, to Tokyo Shibaura Denki Kabushiki Kaisha. TV Camera system having synchronized oscillators in camera head and CCU. 4,318,131, Cl. 358-210.000.
Okuno, Takashi: *See*—
Ikeda, Akinori; Nagai, Fuyuki; and Okuno, Takashi, 4,317,466, Cl. 137-115.000.
Olin Corporation: *See*—
Lederle, Henry F.; and Milnes, Frank J., 4,317,741, Cl. 252-77.000.
Scardera, Michael; and Grosser, Frank R., 4,317,940, Cl. 568-625.000.
Specht, Steven J.; and Kircher, Morton S., 4,317,708, Cl. 204-228.000.
Olivares, Juan P. Process for separating copper and iron minerals from molybdenite. 4,317,543, Cl. 241-16.000.
Olsson, Karl E., to Asea Aktiebolag. Suspension-mounted static electrical converter. 4,318,169, Cl. 363-123.000.

Olympus Optical Co. Ltd.: *See*—
Fukuoka, Kenji, 4,318,095, Cl. 340-706.000.
Mizokami, Kazunori, 4,317,621, Cl. 354-33.000.
Osanai, Akira, 4,318,138, Cl. 360-69.000.
Shibata, Tutomu; Osanai, Akira; Tomabechi, Hideo; and Fujibayashi, Kenji, 4,318,139, Cl. 360-71.000.
Suzuki, Hideo; and Fujimori, Ryo, 4,317,710, Cl. 204-299.00R.

O'Neill, Cormac G.; and Smiley, Parker C., to Physics International Company. Sagittally amplified piezoelectric actuator. 4,318,023, Cl. 310-328.000.

Ono Pharmaceutical Co., Ltd.: *See*—
Tanouchi, Tadao; Kawamura, Masanori; and Hayashi, Masaki, 4,317,828, Cl. 424-263.000.

Ono, Yoshio; Sakamoto, Takashi; and Sano, Tetsuo, to Dainippon Screen Seizo Kabushiki Kaisha. Method and machine for positioning films on base sheets. 4,318,003, Cl. 250-548.000.

Onodera, Toshihiro; Masuda, Youichi; and Nakajima, Akira, to Tokyo Shibaura Denki Kabushiki Kaisha. High frequency switching circuit having preselected parameters to reduce power dissipation therein. 4,318,164, Cl. 363-21.000.

Oonishi, Toshiyuki: *See*—
Nakagawa, Noboru; Oonishi, Toshiyuki; Tsutsumi, Masato; and Kawamoto, Akira, 4,317,335, Cl. 62-199.000.

Orain, Michel A., to Glaenzer Spicer. Method and device for assembling in particular a roller with a journal with interposition of needles. 4,317,602, Cl. 308-207.00R.

Orii, Shingo: *See*—
Hara, Hajime; Orii, Shingo; and Araki, Yoshihiko, 4,317,754, Cl. 525-501.500.

Orphan, Victor J.; and Ginaven, Robert O., to Electric Power Research Institute, Inc. Method and means for optical inspection of the interior surface of tubing. 4,317,632, Cl. 356-241.000.

Orr, Willis P., to Exxon Production Research Company. Emergency blowout preventer (BOP) closing system. 4,317,557, Cl. 251-1.00B.

Ortho Diagnostics, Inc.: *See*—
Lombardo, Igino; and Dussault, Richard A., 4,317,520, Cl. 209-3.100.

Ortho Pharmaceutical Corporation: *See*—
Williams, Bernard L., 4,317,447, Cl. 128-260.000.

Osaka Chemical Laboratory Co., Ltd.: *See*—
Arichi, Shigeru; and Uchida, Yoshihiro, 4,317,816, Cl. 424-182.000.

Osanai, Akira, to Olympus Optical Co., Ltd. Automatic reverse cassette tape recorder with a rotatable head-supporting board. 4,318,138, Cl. 360-69.000.

Osanai, Akira: *See*—
Shibata, Tutomu; Osanai, Akira; Tomabechi, Hideo; and Fujibayashi, Kenji, 4,318,139, Cl. 360-71.000.

Osanai, Hiroshi: *See*—
Suzuki, Yasoji; Takada, Minoru; Satoh, Yasushi; and Osanai, Hiroshi, 4,318,117, Cl. 357-42.000.

Osby, Warren J.: *See*—
Willenbring, Armer J.; Osby, Warren J.; and Gausman, James W., 4,317,564, Cl. 271-223.000.

Ostrowski, Paul C.: *See*—
Haase, Donald J.; Walker, David G.; and Ostrowski, Paul C., 4,317,950, Cl. 585-852.000.

Oswald, Alexis A.; Harting, Gary L.; and Barnum, Harry W., to Exxon Research & Engineering Co. Polyolefin based greases gelled by clays overtreated by higher dialkyl dimethyl ammonium salts. 4,317,737, Cl. 252-28.000.

Oswald, Samuel G. Thermal barrier. 4,317,481, Cl. 160-84.00R.

Otani, Junji: *See*—
Yagi, Shizuo; Otani, Junji; Ikenoya, Yasuo; and Kogure, Hiroshi, 4,317,438, Cl. 123-432.000.

Otsuka Pharmaceutical Co., Ltd.: *See*—
Ishikawa, Hiroshi; Tabusa, Fujio; and Nakagawa, Kazuyuki, 4,317,820, Cl. 424-246.000.

Ott, Karl-Heinz: *See*—
Goyert, Wilhelm; Awater, Albert; Grimm, Wolfgang; Ott, Karl-Heinz; Oberkirch, Wolfgang; and Wagner, Hans, 4,317,890, Cl. 525-66.000.

Oude Alink, Aloysius J. W.: *See*—
Hendriks, Rudolf; Oude Alink, Aloysius J. W.; and Van Marle, Berend P., 4,317,658, Cl. 48-61.000.

Oura, Toshio, to Nippon Electric Co., Ltd. Display apparatus for displaying a pattern having a slant portion. 4,318,097, Cl. 340-728.000.

Ousby, John C.: *See*—
MacLennan, David G.; Ousby, John C.; Owen, Terence R.; and Steer, David C., 4,317,843, Cl. 426-656.000.

Outokumpu Oy: *See*—
Hintikka, Vaino. H.; and Saari, Kaarlo M. J., 4,317,715, Cl. 209-167.000.

Owen, Terence R.: *See*—
MacLennan, David G.; Ousby, John C.; Owen, Terence R.; and Steer, David C., 4,317,843, Cl. 426-656.000.

Oxford, David B.: *See*—
Seitchik, Jerold A.; Closson, Thomas A.; Oxford, David B.; and Schenck, Stephen R., 4,318,187, Cl. 365-8.000.

Oy Wartsila Ab: *See*—
Karkkainen, Jouko, 4,317,573, Cl. 277-113.000.
Martikainen, Kaarlo; and Piiroinen, Paavo, 4,317,347, Cl. 70-366.000.

Ozaki, Sadao: *See*—
Nishihara, Toshikazu; Isono, Hiromasa; Naruse, Tunehide; Ozaki, Sadao; and Takahashi, Noboru, 4,317,675, Cl. 75-0.5BA.

Ozretich, Thomas M.: *See*—
Griffith, Jeffrey D.; and Ozretich, Thomas M., 4,317,672, Cl. 71-27.000.

Pace, Paul D. Wood sanding, grass and wood cutting electric drill attachment device. 4,317,282, Cl. 30-122.000.

Page, Donald F.: *See*—
Lesher, George Y.; and Page, Donald F., 4,317,827, Cl. 424-263.000.

Pako Corporation: *See*—
Willenbring, Armer J.; Osby, Warren J.; and Gausman, James W., 4,317,564, Cl. 271-223.000.

Palmer-Ball, Marion H., Sr., to General Electric Company. Device and method for shipping appliances. 4,317,516, Cl. 206-320.000.

Palmer, John P., to General Dynamics, Pomona Division. Fiber optic bus manifold. 4,317,614, Cl. 350-96.160.

Palosi, Endre; Korbonits, Dezso; Kiss, Pal; Gonczy, Csaba; Heja, Gergely; Cser nee Kun, Judit; Szebeni, Rudolf; Szomor nee Wundele, Maria; and Szvoboda nee Kanzel, Ida, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt. Arylacetic acid derivatives. 4,317,920, Cl. 562-440.000.

Parisot, Claude: *See*—
Boudeau, Jean-Michel; Logue, Michel; and Parisot, Claude, 4,317,951, Cl. 13-18.00C.

Park, John N.: *See*—
Kornrumpf, William P.; Park, John N.; and Chen, De Y., 4,318,165, Cl. 363-21.000.

Park-Ohio Industries, Inc.: *See*—
Nebesar, George C., 4,317,978, Cl. 219-10.710.

Parker, Allen V.: *See*—
Teasley, Granvil E.; and Parker, Allen V., 4,318,019, Cl. 310-156.000.

Parker, Dane K., to Goodyear Tire & Rubber Company, The. Preparation of antioxidants. 4,317,933, Cl. 568-433.000.

Partridge, Malcolm F.; Simpkins, Frederick W.; and Farrington, Lawrence A., to Alden Research Foundation. Recording graphic data of different transmission rates. 4,318,134, Cl. 358-287.000.

Pask, George: *See*—
Steel, Thomas; Hooke, Noel H.; and Pask, George, 4,317,646, Cl. 415-116.000.

Patchornik, Abraham: *See*—
Warshawsky, Abraham; Kalir, Rami; and Patchornik, Abraham, 4,317,887, Cl. 521-38.000.

Patelhold Patentverwertungs- & Elektro-Holding AG: *See*—
Kach, Alfred, 4,318,064, Cl. 333-202.000.

Paterson, Malcolm M., to Raytheon Company. Glass separation apparatus. 4,317,718, Cl. 209-215.000.

Pau, James: *See*—
Tanaka, Kunihide; Elliott, Michael T.; Chung, Sam; Pau, James; Gray, Linda; Hou, Liping D.; F'Mayer, Mary; Warren, David; and Finch, Karen, 4,317,700, Cl. 156-652.000.

Pauliukonis, Richard S. Momentary contact diverter valve. 4,317,469, Cl. 137-625.650.

Paxson, Timm E.: *See*—
Kim, Leo; Paxson, Timm E.; and Tang, Sunny C., 4,317,936, Cl. 568-454.000.

Pcolinsky, Michael P., Jr., to Tenneco Chemicals, Inc. Intumescent flexible polyurethane foam. 4,317,889, Cl. 521-107.000.

Pease, William M.: *See*—
Byington, Roy E.; and Pease, William M., 4,318,183, Cl. 364-900.000.

Peavey, Hartley D.: *See*—
Sondermeyer, Jack C., 4,318,053, Cl. 330-281.000.

Peek, Johannes B. H.; Mecklenbrauker, Wolfgang F. G.; Claasen, Theodoor A. C. M.; and van Hurck, Nicolaas, to U.S. Philips Corporation. (b+a)-Bit-A/D convertor with b-bit auxiliary A/D convertor. 4,318,086, Cl. 340-347.0AD.

Peeling, Richard C., to Bethlehem Steel Corporation. Fatigue and corrosion resistant flexible wire strand assembly. 4,317,640, Cl. 403-36.000.

Pelt & Hooykaas B.V.: *See*—
Hooykaas, Carel W. J., 4,317,684, Cl. 106-316.000.

Penird, Carl W.; and Tamburrino, Richard A., to North American Philips Consumer Electronics Corp. Shadow mask microphonic suppressor. 4,318,025, Cl. 313-404.000.

Pepicelli, Pasquale L.; and Yonkers, Edward, to Data Packaging Corporation. Video storage rack. 4,317,603, Cl. 312-9.000.

Per-Fil Industries: *See*—
Boellmann, Horst E., 4,317,649, Cl. 425-150.000.

Percarpio, Edward P., to Becton, Dickinson and Company. Multiple sample needle with anti-backflow valve. 4,317,456, Cl. 128-766.000.

Perel, Julius; and Mahoney, John F., to Phrasor Scientific, Inc. Ion generator. 4,318,028, Cl. 315-111.810.

Perkins & Powell Limited: *See*—
Chaddock, Dennis H., 4,317,254, Cl. 16-61.000.

Persson, Gert: *See*—
Carlstrom, Per; and Persson, Gert, 4,317,314, Cl. 51-177.000.

Peters, Edmund J.: *See*—
Cordova, Ronald J.; Peters, Edmund J.; and Martin, James S., 4,318,137, Cl. 360-32.000.

Petersen, Kurt E., to International Business Machines Corporation. Optical ray deflection apparatus. 4,317,611, Cl. 350-6.600.

Petrow, Vladimir: *See*—
Benson, Harvey D.; Grunwell, Joyce F.; Johnston, John O.; and Petrow, Vladimir, 4,317,818, Cl. 424-242.000.

Petters, Claus: *See*—
Grawe, Helmut; and Petters, Claus, 4,317,414, Cl. 102-406.000.

Pettersson, Jan G. T.: *See*—
Lundqvist, Inge J.; Pettersson, Jan G. T.; and Fladda, Gerdt H., 4,318,180, Cl. 364-555.000.

Pettersson, Kjell: *See*—
Malmberg, Gunnar; Andersson, Roger; and Pettersson, Kjell, 4,317,324, Cl. 56-11.300.

Pfalzer, Lothar; and Siegbert/Fischer, Holzwirt, to J. M. Voith GmbH. Apparatus for treating waste-paper. 4,317,701, Cl. 162-234.000.

Pfiester, James R.: *See*—
McAlister, Doyle V.; and Pfiester, James R., 4,318,014, Cl. 307-463.000.

Pfoertner, Karlheinz: *See*—
Bernauer, Karl; and Pfoertner, Karlheinz, 4,317,914, Cl. 548-239.000.

Phelps, N. Eric. Insulating window blind. 4,317,480, Cl. 160-23.00R.

Phillips Petroleum Company: *See*—
Bruning, Donald D., 4,317,758, Cl. 524-202.000.
Heckelsberg, Louis F., 4,317,948, Cl. 585-329.000.
Makovec, Donald J.; and Haskell, Donald M., 4,317,795, Cl. 422-62.000.
Mustard, Jack L., 4,317,378, Cl. 73-863.010.
Richards, Frank P.; and Taylor, Raymond C., 4,317,323, Cl. 53-563.000.
Stewart, William S.; Funk, Gary L.; and Huang, Warren H., 4,318,178, Cl. 364-502.000.

Phillips, Robert F.: *See*—
McIntyre, James A.; and Phillips, Robert F., 4,317,704, Cl. 204-1.00R.

Phleger, Charles F.: *See*—
Leighton, David L.; and Phleger, Charles F., 4,317,429, Cl. 119-2.000.

Phrasor Scientific, Inc.: *See*—
Perel, Julius; and Mahoney, John F., 4,318,028, Cl. 315-111.810.

Physics International Company: *See*—
O'Neill, Cormac G.; and Smiley, Parker C., 4,318,023, Cl. 310-328.000.

Piccardi, Paolo: *See*—
Massardo, Pietro; Cassani, Giorgio; and Piccardi, Paolo, 4,317,905, Cl. 542-413.000.

Pierburg GmbH & Co. KG: *See*—
Dohrmann, Rolf; Henke, Ulrich; and Marusiak, Wojciech, 4,318,070, Cl. 337-3.000.

Pierrot, Robert; Gautier, Francois; and Crochet, Pierre, to Thomson-CSF. Printed monopulse primary source for airport radar antenna and antenna comprising such a source. 4,318,107, Cl. 343-700.0MS.

Pigerol, Charles; Chandavoine, Marie-Madeleine; and de Cointet de Fillain, Paul, to Labaz. Dihydropyridine derivatives as stabilizers for vinyl chloride polymers. 4,317,768, Cl. 524-99.000.

Piiroinen, Paavo: *See*—
Martikainen, Kaarlo; and Piiroinen, Paavo, 4,317,347, Cl. 70-366.000.

Pilhall, Stig T. L., to AB Volvo. Passive safety belt system for motor vehicles. 4,317,583, Cl. 280-804.000.

Piper, Fritz: *See*—
Zimmerman, Hans; Piper, Fritz; Wierth, Gerd; and Nagel, Hartmut, 4,317,563, Cl. 271-211.000.

Pizzolato, Giacomo: *See*—
Confalone, Pasquale N.; Pizzolato, Giacomo; Uskokovic, Milan R.; and Rouge, Marianne, 4,317,915, Cl. 549-68.000.

Platt Saco Lowell Limited: *See*—
Blackburn, Reginald M., deceased, 4,317,260, Cl. 19-107.000.

Plessey Handel und Investments AG: *See*—
Enein, Mohamed H., 4,318,104, Cl. 343-100.0LE.

Plibrico Company: *See*—
Courshon, Jacob B., Jr.; and Rutkay, Nicholas G., 4,317,418, Cl. 110-331.000.

Plitz, Gernot. Safety closure cap. 4,317,526, Cl. 215-217.000.

Poirier, Joseph L., to United States of America, Air Force. Intrusion detection system having look-up sensor instrumentation for intrusion range and altitude measurements. 4,318,102, Cl. 343-12.00A.

Poix, Claude: *See*—
Migeon, Jean P.; and Poix, Claude, 4,318,017, Cl. 310-42.000.

Pokhodnya, Igor K.; and Golovko, Vladimir N. Flux composition for flux-cored wire. 4,317,688, Cl. 148-24.000.

Polaroid Corporation: *See*—
Coppa, Richard J.; Lim, James K.; and Rodriguez, Marie T., 4,317,620, Cl. 354-33.000.
Morse, John B., 4,318,069, Cl. 336-192.000.
Shenk, Edwin K., 4,317,624, Cl. 354-139.000.
Van Allen, David, 4,317,625, Cl. 354-145.000.

Pollack, Jack, to Chicago Bridge & Iron Company. Mooring line handling apparatus. 4,317,421, Cl. 114-230.000.

Pollock, Keith B. Trickle irrigation. 4,317,539, Cl. 239-1.000.

Polvi, Esko: *See*—
Johansson, Sven; Kolsmyr, Roland; Madsen, Kristian D.; and Polvi, Esko, 4,318,021, Cl. 310-260.000.

Poniatowski, Steven: *See*—
Chase, Thomas G.; and Poniatowski, Steven, 4,317,265, Cl. 29-132.000.

Poore, William H.: *See*—
Geppelt, Elmo W.; and Poore, William H., 4,317,353, Cl. 72-299.000.

Popov, Mitko S.; Djedjeva, Galina M.; Todorov, Ivan O.; and Stoeva, Nelly S., to Institute Po Microbiologia. Method for obtaining of glucose isomerase. 4,317,883, Cl. 435-234.000.

Porcher, Alain: *See*—
Zmokly, Tadeusz; and Porcher, Alain, 4,317,990, Cl. 235-494.000.

Porta Systems Corp.: *See*—
Fasano, Michael, 4,318,153, Cl. 361-119.000.

Porte, Allen L., to Hughie Big Canoe. Chest protector. 4,317,237, Cl. 2-2.000.

Poshkus, Gerald M., to Eastman Kodak Company. Photo-identification card pack. 4,317,626, Cl. 354-180.000.

PPG Industries, Inc.: *See*—
Lewarchik, Ronald J.; and Carter, Betty J., 4,317,894, Cl. 525-455.000.

Prain, Hunter D.: *See*—
Durant, Graham J.; Emmett, John C.; Ganellin, Charon R.; and Prain, Hunter D., 4,317,829, Cl. 424-269.000.

Prather, William H.: *See*—
Emrich, Robert K.; Prather, William H.; and Burkhart, John M., 4,317,300, Cl. 37-142.00R.

Prehaut, Jacques: *See*—
Groult, Pierre; Civier, Danielle; and Prehaut, Jacques, 4,317,789, Cl. 264-105.000.

Prentice, Alan L., to Air Products and Chemicals, Inc. Cryogenic freezing system. 4,317,665, Cl. 62-63.000.

Pressman, Gerald L.; and Gardiner, Kenneth W., to ElectroPrint, Inc. Method of charging a multilayered apertured element in an electrostatic imaging process. 4,318,002, Cl. 250-492.200.

Price, Barry J.: *See*—
Clitherow, John W.; Price, Barry J.; Bradshaw, John; and Martin-Smith, Michael, 4,317,819, Cl. 424-244.000.

Price, Douglas A. Height sensing for box closer. 4,317,319, Cl. 53-76.000.

Priesemuth, Wolfgang. Windshield wiper. 4,317,251, Cl. 15-250.410.

Prindle, William A. Flatware eating utensils. 4,317,284, Cl. 30-340.000.

Prismo Universal Corporation: *See*—
Hutchinson, Robert S.; and Greiner, William L., III, 4,317,696, Cl. 156-523.000.

Procter & Gamble Company, The: *See*—
Crawford, Robert J., 4,317,779, Cl. 260-400.000.

Produits Chimiques Ugine Kuhlmann: *See*—
Strassel, Albert, 4,317,860, Cl. 428-421.000.

Provance, Jason D.; and Allison, Kevin W., to Ferro Corporation. Thick film conductor employing cobalt oxide. 4,317,749, Cl. 252-519.000.

Provance, Jason D.; and Allison, Kevin W., to Ferro Corporation. Thick film conductor employing nickel oxide. 4,317,750, Cl. 252-519.000.

Provincial Holdings Ltd.: *See*—
Wilkomirsky, Igor A. E.; Boorman, Roy S.; and Salter, Robert S., 4,317,803, Cl. 423-99.000.

Prunet, Achille. Device for transforming an enclosure or container into a self-evacuating container and container comprising such a device. 4,317,410, Cl. 99-277.200.

Przybylinski, Phillip, to Pullman Incorporated. Pneumatic discharge arrangement. 4,317,532, Cl. 222-505.000.

Przyjemski, Joseph M., to United States of America, Air Force. Crystal oscillator compensated for g-sensitivity. 4,318,063, Cl. 331-158.000.

Pudelko, Heinz; and Weber, Klaus, to VDO Adolf Schindling AG. Thick-film potentiometer. 4,318,075, Cl. 338-162.000.

Puglia, Wayne J.: *See*—
Kehoe, Gary; Puglia, Wayne J.; Witzel, Frank; Friello, Dominick R.; and Mackay, Donald A. M., 4,317,837, Cl. 426-3.000.

Pullman Incorporated: *See*—
Galasan, Felixberto A.; Watson, Thomas H.; and Barkhimer, Robert L., 4,317,415, Cl. 105-378.000.
Przybylinski, Phillip, 4,317,532, Cl. 222-505.000.

Purdy, Kenneth R.: *See*—
Bowen, Mack D.; and Purdy, Kenneth R., 4,317,703, Cl. 201-1.000.

Pye (Electronic Products) Ltd.: *See*—
Bennett, Arthur J.; and Roberts, Peter R. T., 4,317,336, Cl. 62-514.00R.

Pynnonen, Pentti. Inside flow filter. 4,317,721, Cl. 210-120.000.

Quaker Oats Company, The: *See*—
Menting, James E., 4,317,763, Cl. 523-144.000.

Quan, Wing C.; and Ludwig, Richard H., to Westinghouse Electric Corp. Elevator system. 4,317,506, Cl. 187-29.00R.

Quitmann, Horst: *See*—
Reinartz, Hans-Dieter; and Quitmann, Horst, 4,318,078, Cl. 340-59.000.

R. E. Davis Chemical Corporation: *See*—
Davis, Robert E., 4,317,996, Cl. 250-302.000.

Rader, Charles W.: *See*—
Myers, Ronald I.; and Rader, Charles W., 4,317,387, Cl. 74-493.000.

Radzik, Edward S. Wood splitting device. 4,317,476, Cl. 144-194.000.

Rae, Thomas A., Jr. Comb with integral clip for attaching to a support. 4,317,465, Cl. 132-149.000.

Rainer, Georg, to Byk Gulden Lomberg Chemische Fabrik GmbH. Pyrazolobenzodiazepinones, their intermediates, their compositions and their use. 4,317,823, Cl. 424-248.540.

Raley, Garland E.; and Adams, James M., to Ethyl Corporation. Process for producing perforated film. 4,317,792, Cl. 264-504.000.

Ramsey, Eugene P., to General Motors Corporation. Vehicle seat bolster wire assembly. 4,317,591, Cl. 297-455.000.

Rank, William J.; and Whalen, Michael J., to Control Data Corporation. Apparatus for mounting circuit cards. 4,318,157, Cl. 361-386.000.

Rapp, Joachim; and Bittmann, Peter, to Elba-Werk Maschinen-Gesellschaft mbH & Co. Method of feeding water to a concrete mix. 4,318,177, Cl. 364-502.000.

Rapp, Walter W.; and Crosby, Gary A., to Red Fox Industries Inc. Sewage treatment. 4,317,723, Cl. 210-202.000.

Rasberger, Michael; and Karrer, Friedrich, to Ciba-Geigy Corporation. Piperidine containing cyanuric acid derivatives. 4,317,911, Cl. 544-222.000.

Rasmussen, Thomas K.: *See—*
Huftel, Terrance D.; Odegaard, Lester B.; and Rasmussen, Thomas K., 4,317,535, Cl. 227-19.000.

Rathmell, Richard K. Vacuum-insulated panel. 4,317,854, Cl. 428-182.000.

Rauffer, Walter, to Agfa-Gevaert Aktiengesellschaft. Microfiche apparatus. 4,317,619, Cl. 353-25.000.

Ravizza, Raymond F., to Ampex Corporation. Automatically compensated movable head servo circuit and method. 4,318,142, Cl. 360-77.000.

Ray-O-Vac Corporation: *See—*
Joshi, Ashok V.; Gillotti, Albert L.; and Sholette, William P., 4,317,874, Cl. 429-213.000.

Raychem Corporation: *See—*
Clarke, Raymond, 4,317,616, Cl. 350-96.340.

Raytheon Company: *See—*
Byington, Roy E.; and Pease, William M., 4,318,183, Cl. 364-900.000.
Faxon, Merle W., 4,318,168, Cl. 363-56.000.
Paterson, Malcolm M., 4,317,718, Cl. 209-215.000.

RCA Corporation: *See—*
Acampora, Alfonse, 4,318,120, Cl. 358-12.000.
Carlson, David E., 4,317,844, Cl. 427-39.000.
D'Amato, Ralph J., 4,318,026, Cl. 313-448.000.
Fitzgerald, William V., 4,318,035, Cl. 315-387.000.
Harwood, Leopold A.; and Wittmann, Erwin J., 4,318,051, Cl. 330-254.000.
Hughes, Richard H.; and Chen, Hsing-Yao, 4,318,027, Cl. 315-15.000.
Knop, Karl H., 4,318,123, Cl. 358-43.000.
Krupa, John E.; Magness, Preston L.; and Brady, Thomas J., 4,318,045, Cl. 328-18.000.
Schade, Otto H., Jr., 4,318,015, Cl. 307-475.000.
Turner, Clarence C., 4,317,427, Cl. 118-503.000.
Wilson, Robert E., 4,318,087, Cl. 340-365.00S.

Rech, Werner; Welsch, Wolfgang; and Zimlich, Josef, to Heimann GmbH. Flash tube. 4,318,024, Cl. 313-220.000.

Red Fox Industries Inc.: *See—*
Rapp, Walter W.; and Crosby, Gary A., 4,317,723, Cl. 210-202.000.

Reed, Norman D., to W. S. Dickey Clay Manufacturing Co. Method and apparatus for forming fiber reinforced coupling sleeves. 4,317,693, Cl. 156-175.000.

Reese, Max G.; and Hales, Richard H., to Becton Dickinson & Company. Production of radioiodinated T_3 and T_4. 4,317,921, Cl. 562-444.000.

Regie Nationale des Usines Renault: *See—*
Barre, Michel; and Carrion, Jean P., 4,317,533, Cl. 224-42.210.
Cottin, Claude; and Le Veux, Bernard, 4,317,582, Cl. 280-751.000.

Reid, Joyce: *See—*
Hauck, Frederic P.; and Reid, Joyce, 4,317,910, Cl. 544-154.000.

Reinartz, Hans-Dieter; and Quitmann, Horst, to ITT Industries, Inc. Brake fluid level warning apparatus. 4,318,078, Cl. 340-59.000.

Repa Feinstanzwerk GmbH: *See—*
Fohl, Artur, 4,317,263, Cl. 24-230.0AT.

Research Corporation: *See—*
Nicolaou, Kyriacos C.; Magolda, Ronald L.; and Claremon, David A., 4,317,935, Cl. 568-445.000.

Resource Recovery Limited: *See—*
Clark, Reginald H.; MacArthur, John D.; Sayer, Michael; and Wilder, William D., 4,317,521, Cl. 209-558.000.

Reunanen, Kosti, to Reunanen & Roviola Oy. Method and apparatus for the manufacture of reinforcement spirals. 4,317,349, Cl. 72-142.000.

Reunanen & Roviola Oy: *See—*
Reunanen, Kosti, 4,317,349, Cl. 72-142.000.

Reynolds Metals Company: *See—*
Boice, Elvin G., 4,317,585, Cl. 285-93.000.
McLean, John R., 4,317,697, Cl. 156-583.100.

Rhone-Poulenc Industries: *See—*
Gielly, Jean-Francois; Lizee, Dominique; and Sohier, Bernard, 4,317,807, Cl. 423-320.000.

Richards, Frank P.; and Taylor, Raymond C., to Phillips Petroleum Company. Apparatus for producing containers. 4,317,323, Cl. 53-563.000.

Richardson, James H.: *See—*
Alt, Robert D.; Richardson, James H.; and Williams, Alverson B., 4,317,497, Cl. 180-68.500.

Richardson-Merrell Inc.: *See—*
Benson, Harvey D.; Grunwell, Joyce F.; Johnston, John O.; and Petrow, Vladimir, 4,317,818, Cl. 424-242.000.
Blohm, Thomas R.; and Metcalf, Brian W., 4,317,817, Cl. 424-226.000.

Richardson, Ryden L., to Union Oil Company of California. Hydrotreating catalysts. 4,317,746, Cl. 252-435.000.

Ricoh Company, Ltd.: *See—*
Eda, Tadahiro; Tatsumi, Susumu; and Imai, Chikara, 4,318,042, Cl. 324-72.500.

Ridgway, John W., to Interox Chemicals Limted. Disinfection. 4,317,813, Cl. 424-130.000.

Riedinger, Franz W., to Deere & Company. Articulated combine. 4,317,326, Cl. 56-14.600.

Riegler, Hannes; and Wittwer, Ulrich. Electrical line-connector. 4,317,969, Cl. 200-52.00R.

Riem, Roland H.: *See—*
Torok, John; McCaffrey, Eugene F.; Riem, Roland H.; and Cheung, Wing S., 4,317,748, Cl. 252-472.000.

Riser, Rene, to Swiss Aluminium Ltd. Drive mechanism for the leaf or leaves of a sliding door or the like. 4,317,382, Cl. 74-25.000.

Rite Autotronics Corporation: *See—*
Schwartz, Edwin L.; and Langan, Allen W., 4,317,468, Cl. 137-540.000.

Rizzi, Luigi, to Societa Italiana Telecomunicazioni Siemens S.p.A. Circuit arrangement for controlling the energization of a load from a plurality of current sources. 4,318,007, Cl. 307-44.000.

RK Industries: *See—*
Roth, Verlon C., 4,317,971, Cl. 200-83.00J.

Roanto Investment N.V.: *See—*
Baptista, Roberto J., 4,317,477, Cl. 150-1.50B.

Roberge, Jean M., to Northern Telecom Limited. Planetary 'SZ' twist accumulators. 4,317,329, Cl. 57-294.000.

Robert Bosch GmbH: *See—*
Finkbeiner, Ludwig; and De Paoli, Albano, 4,317,559, Cl. 251-331.000.
Lauterbach, Heinz, 4,317,365, Cl. 73-204.000.

Roberts, Peter R. T.: *See—*
Bennett, Arthur J.; and Roberts, Peter R. T., 4,317,336, Cl. 62-514.00R.

Roberts, Thomas E., Jr.; Abbott, John A.; and Wright, Bruce M., to FMC Corporation. Gas absorber. 4,317,731, Cl. 210-741.000.

Robinson, Thomas P., to Baxter Travenol Laboratories, Inc. Catheter insertion unit with separate flashback indication for the cannula. 4,317,445, Cl. 128-214.400.

Roblin Industries, Inc.: *See—*
Sauer, Gale E., 4,317,318, Cl. 52-667.000.
Sauer, Gale E., 4,317,641, Cl. 403-347.000.

Robota, Stephen; and Baxamusa, Yusuf A., to Hooker Chemicals & Plastics Corp. Removal of hydrogen fluoride from gaseous mixtures of hydrogen fluoride and hydrogen chloride. 4,317,805, Cl. 423-240.000.

Rockwell International Corporation: *See—*
Tanaka, Kunihide; Elliott, Michael T.; Chung, Sam; Pau, James; Gray, Linda; Hou, Liping D.; F'Mayer, Mary; Warren, David; and Finch, Karen, 4,317,700, Cl. 156-652.000.

Rodemann, Alfred H.: *See—*
Breglia, Denis R.; and Rodemann, Alfred H., 4,317,610, Cl. 350-3.770.

Rodriguez, Marie T.: *See—*
Coppa, Richard J.; Lim, James K.; and Rodriguez, Marie T., 4,317,620, Cl. 354-33.000.

Roettele, Donald L.; and Yohpe, William E., to ComGeneral Corporation. Compact radar detector and range extender. 4,318,103, Cl. 343-18.00E.

Rogus, Joseph J.: *See—*
Ambrosio, Thomas J.; Buchman, Henry J.; Rogus, Joseph J.; and Sochon, Henry R., 4,317,446, Cl. 128-218.00R.

Rohe, William C.: *See—*
Baum, Carl M.; and Rohe, William C., 4,317,416, Cl. 108-157.000.

Rollinger, Bernt: *See—*
Weber, Ralph; Elsner, Emil; Maschlanka, Walter; Rollinger, Bernt; and Sanders, Gerhard, 4,317,677, Cl. 75-43.000.

Rolls-Royce Limited: *See—*
Steel, Thomas; Hooke, Noel H.; and Pask, George, 4,317,646, Cl. 415-116.000.

Romagnoli, Andrea, to I.M.A. - Industria Macchine Automatiche S.p.A. Die cutter for stamping rectangular objects with rounded corners. 4,317,399, Cl. 83-237.000.

Rooney, John J.: *See—*
Dale, Robert W.; and Rooney, John J., 4,317,460, Cl. 131-334.000.

Rosen, Perry: *See—*
Burri, Kasper F.; and Rosen, Perry, 4,317,775, Cl. 260-239.100.

Ross, Richard J., to Baker International Corporation. Pump catcher apparatus. 4,317,485, Cl. 166-216.000.

Rossler, Frederick W., Jr.; and Feldman, Steven, to AMP Incorporated. Temperature sensor. 4,318,073, Cl. 338-28.000.

Roth, Verlon C., to RK Industries. Adjustable pressure and vacuum limit switch valve. 4,317,971, Cl. 200-83.00J.

Rothschild, Alexander M.: *See—*
Freedman, Morris D.; Whiteside, Arliss E.; and Rothschild, Alexander M., 4,318,173, Cl. 364-200.000.

Rottleb, Dieter, to Gutermann & Co., Aktiengesellschaft. Spool for thread. 4,317,548, Cl. 242-125.200.

Rouge, Marianne: *See—*
Confalone, Pasquale N.; Pizzolato, Giacomo; Uskokovic, Milan R.; and Rouge, Marianne, 4,317,915, Cl. 549-68.000.

Rouxel, Jean: *See—*
Le Mehaute, Alain; Rouxel, Jean; and Le Blanc-Soreau, Annie, 4,317,873, Cl. 429-197.000.

Royall, David J.: *See—*
Jones, Peter J.; and Royall, David J., 4,317,919, Cl. 562-414.000.

Ruhrchemie Aktiengesellschaft: *See—*
Bernhagen, Wolfgang; Weber, Jurgen; Bahrmann, Helmut; and Springer, Helmut, 4,317,945, Cl. 568-853.000.

Weber, Jurgen; Bernhagen, Wolfgang; and Springer, Helmut, 4,317,925, Cl. 562-531.000.

Russell Corporation: *See—*
Adamson, Fletcher D., 4,317,261, Cl. 19-265.000.

Russo, Ronald D.; Blinkhorn, Francis E.; and Curado, Len L., to C. R. Bard, Inc. Body fluid drain. 4,317,452, Cl. 128-350.00R.

Rutkay, Nicholas G.: *See—*
Courshon, Jacob B., Jr.; and Rutkay, Nicholas G., 4,317,418, Cl. 110-331.000.

S. C. Johnson & Son, Inc.: *See—*
Gregory, Gordon K., 4,317,755, Cl. 524-276.000.

Saari, Kaarlo M. J.: *See—*
Hintikka, Vaino. H.; and Saari, Kaarlo M. J., 4,317,715, Cl. 209-167.000.

Sabon, Robert J., to GTE Automatic Electric Labs Inc. Contactless electromagnetic relay. 4,318,074, Cl. 338-32.00H.

Saikawa, Isamu; Takano, Shuntaro; Momonoi, Kaishu; Takakura, Isamu; Kuroda, Seietsu; Tanaka, Kiyoshi; Hayashi, Kenshin; Nagahashi, Bunei; and Kutani, Chiaki, to Toyama Chemical Co., Ltd. Process for producing 7-(substituted)amino-3-substituted thiomethyl cephem carboxylic acids. 4,317,907, Cl. 544-21.000.

Saito, Junichi; and Kume, Toyohiko, to Nihon Tokushu Noyaku Seizo K.K. Preparation and use of bis-(1-bromo-2,3,3-trichloro-2-propenyl) ether. 4,317,937, Cl. 568-488.000.

Saito, Susumu, to Shinku Laboratory Co., Ltd. Apparatus for plating a printing roller. 4,317,706, Cl. 204-198.000.

Saito, Tadao; Kishi, Takao; and Kakuta, Yoshiyuki, to Yoshino Kogyosho Co., Ltd. Accumulator type manual atomizer. 4,317,531, Cl. 222-321.000.

Saito, Toranosuke; and Ohishi, Hiroyuki, to Sanko Kaihatsu Kagaku Kenkyusho. Flame retardants. 4,317,769, Cl. 524-117.000.

Saka, Tatsuo: *See—*
Mizukawa, Takumi; Amagami, Keizo; Kiuchi, Mitsuyuki; Yoshida, Hirokazu; and Saka, Tatsuo, 4,317,975, Cl. 219-10.49R.

Sakaguchi, Iwao; and Hayashi, Yoshiaki, to Sumitomo Chemical Company, Limited. Process for producing dioxazine violet pigment. 4,317,908, Cl. 544-74.000.

Sakamoto, Takashi: *See—*
Ono, Yoshio; Sakamoto, Takashi; and Sano, Tetsuo, 4,318,003, Cl. 250-548.000.

Sakano, Hajime; Ito, Akitoshi; and Terada, Miyuki, to Sumitomo Naugatuck Co., Ltd. Thermoplastic composition containing polycarbonate, polyamide and rubbery graft copolymer. 4,317,891, Cl. 525-66.000.

Sakurai, Shubun; and Goda, Hiroyuki. Typewriter ribbon including a correction strip. 4,317,637, Cl. 400-240.100.

Salladay, Mack: *See—*
Stephens, Leonard W.; and Salladay, Mack, 4,317,392, Cl. 81-63.100.

Salser, Josephine S.: *See—*
Balis, M. Earl; Higgins, Paul J.; and Salser, Josephine S., 4,317,877, Cl. 435-7.000.

Salter, Robert S.: *See—*
Wilkomirsky, Igor A. E.; Boorman, Roy S.; and Salter, Robert S., 4,317,803, Cl. 423-99.000.

Salters, Roelof H. W.: *See—*
Koomen, Joannes J. M.; and Salters, Roelof H. W., 4,317,690, Cl. 148-187.000.

Sander, Anthony J.; Sciffer, Jack P.; and Whitton, Richard W., to Australian Wire Industries Proprietary Limited. Apparatus for controlling metal coatings on wire, strip and the like emerging from metal baths. 4,317,428, Cl. 118-623.000.

Sander, Engelbert, to Automation Industrielle SA. Apparatus for making head pieces with a membrane for packaging containers of laminate with a metallic barrier layer. 4,317,420, Cl. 425-112.000.

Sanders Associates, Inc.: *See—*
Brodeur, Lester R., 4,318,105, Cl. 343-103.000.

Sanders, Gerhard: *See—*
Weber, Ralph; Elsner, Emil; Maschlanka, Walter; Rollinger, Bernt; and Sanders, Gerhard, 4,317,677, Cl. 75-43.000.

Sanjiki, Tetsutaro: *See—*
Atsumi, Toshio; Sanjiki, Tetsutaro; and Kiyohara, Takao, 4,317,825, Cl. 424-250.000.

Sanko Kaihatsu Kagaku Kenkyusho: *See—*
Saito, Toranosuke; and Ohishi, Hiroyuki, 4,317,769, Cl. 524-117.000.

Sano, Tetsuo: *See—*
Ono, Yoshio; Sakamoto, Takashi; and Sano, Tetsuo, 4,318,003, Cl. 250-548.000.

Sanraku-Ocean Co., Ltd.: *See—*
Yagi, Yoshiaki; Kouno, Kageaki; and Inui, Taiji, 4,317,881, Cl. 435-97.000.

Sapatino, Bruno V.: *See—*
Johnson, Luther R.; and Sapatino, Bruno V., 4,317,886, Cl. 435-285.000.

Sargent, Jack, to Innovative Design, Inc. Apparatus and method for measurement of board length. 4,317,989, Cl. 235-92.0DN.

Sarvela, Jussi. High lift dump trailer. 4,317,593, Cl. 298-11.000.

Sasaki, Makoto: *See—*
Tsuchiya, Shozo; Sasaki, Makoto; and Hayashi, Hideo, 4,317,753, Cl. 524-504.000.

Sasaoka, Ryosuke; Ishino, Yasuo; and Maekawa, Kaoru, to Matsushita Electric Industrial Co., Ltd. Electronic air cleaner. 4,317,661, Cl. 55-131.000.

Sassiver, Martin L.; and Boothe, James H., to American Cyanamid Company. 6-[D-α-(Coumarin-3-carboxamido)arylacetamido]-penicillanic acids or salts. 4,317,774, Cl. 260-239.100.

Sassler, Marvin L. Multiplexed video transmission apparatus for satellite communications. 4,318,126, Cl. 358-141.000.

Sato, Tadashi, to Amada Company, Limited. Multiple-disk clutches. 4,317,512, Cl. 192-85.0AA.

Sato, Takahisa; Baba, Masao; and Okane, Michito, to Nippon Shokubai Kagaku Kogyo Co., Ltd. Process for preparing and recovering acrylic acid. 4,317,926, Cl. 562-532.000.

Sato, Yasuo: *See—*
Karasawa, Kunihiko; Hosoda, Tokushiro; Mase, Hiroshi; Sato, Yasuo; and Shimada, Shoji, 4,317,845, Cl. 427-47.000.

Satoh, Shin: *See—*
Susa, Kenzo; Matsuyama, Iwao; Satoh, Shin; and Suganuma, Tsuneo, 4,317,668, Cl. 65-29.000.

Satoh, Yasushi: *See—*
Suzuki, Yasoji; Takada, Minoru; Satoh, Yasushi; and Osanai, Hiroshi, 4,318,117, Cl. 357-42.000.

Satow, Haruhiko: *See—*
Shimizu, Kazuma; and Satow, Haruhiko, 4,317,648, Cl. 418-120.000.

Sattler, Frank A., to Westinghouse Electric Corp. Ultraviolet curable solvent-free wire enamel blends. 4,317,858, Cl. 428-379.000.

Sauer, Gale E., to Roblin Industries, Inc. Supporting grid system having interchangeable T sections. 4,317,318, Cl. 52-667.000.

Sauer, Gale E., to Roblin Industries, Inc. Locking connection for supporting grid systems. 4,317,641, Cl. 403-347.000.

Sausele, George J. H. Microidentification system. 4,317,287, Cl. 33-24.00R.

Sauvanet, Maurice, to Thomson-CSF. Process and device for retrieving digital data in the presence of noise and distortions. 4,318,128, Cl. 358-147.000.

Sayer, Michael: *See—*
Clark, Reginald H.; MacArthur, John D.; Sayer, Michael; and Wilder, William D., 4,317,521, Cl. 209-558.000.

Scardera, Michael; and Grosser, Frank R., to Olin Corporation. Biodegradable surfactants. 4,317,940, Cl. 568-625.000.

Scarnato, Thomas J.; Hoch, Manfried L.; and Miner, Robert C., to International Harvester Company. Hitch adapter. 4,317,580, Cl. 280-415.00R.

Schade, Otto H., Jr., to RCA Corporation. Level shift circuit. 4,318,015, Cl. 307-475.000.

Schally, Andrew V.: *See—*
Coy, David H.; and Schally, Andrew V., 4,317,815, Cl. 424-177.000.

Scheffels, Wilhelm; and Hoffmann, Ruprecht, to Steigerwald Strahltechnik GmbH. Setting the electron gun cathode heating current of an electron beam machine. 4,317,983, Cl. 219-121.0EA.

Scheler, Siegfried; and Thoese, Klaus, to Hoechst Aktiengesellschaft. Recording material containing diazo compounds and process for the manufacture thereof. 4,317,875, Cl. 430-8.000.

Schelling & Co.: *See—*
Ess, Wilfried, 4,317,397, Cl. 83-35.000.

Schenck, Stephen R.: *See—*
Seitchik, Jerold A.; Closson, Thomas A.; Oxford, David B.; and Schenck, Stephen R., 4,318,187, Cl. 365-8.000.

Scherer, Heinz: *See—*
Kratel, Gunter; Stohr, Gunter; and Scherer, Heinz, 4,317,762, Cl. 523-203.000.

Schering AG: *See—*
Boroschewski, Gerhard; and Arndt, Friedrich, 4,317,674, Cl. 71-111.000.

Schering Corporation: *See—*
Ambrosio, Thomas J.; Buchman, Henry J.; Rogus, Joseph J.; and Sochon, Henry R., 4,317,446, Cl. 128-218.00R.

Schiek, James M., to Brunswick Corporation. Marine drive gear housing. 4,317,655, Cl. 440-78.000.

Schlichting, Josef: *See—*
Halene, Clemens; Schlichting, Josef; and Strack, Karl, 4,317,348, Cl. 72-62.000.

Schlumberger Technology Corporation: *See—*
Hertzog, Russel C., Jr.; and Nelligan, William B., 4,317,993, Cl. 250-270.000.

Schmidt, Richard. Flexible torque coupling for parallel, angular and/or axial misalignment. 4,317,339, Cl. 64-11.00R.

Schmidt-Traub, Henner: *See—*
Tewes, Giesbert; and Schmidt-Traub, Henner, 4,317,366, Cl. 73-339.00A.

Schmit, Joseph L.: *See—*
Bowers, John E.; and Schmit, Joseph L., 4,317,689, Cl. 148-171.000.

Schmitt, Nancy. Adjustable plant receptacle. 4,317,311, Cl. 47-66.000.

Schneider, Erich, to Kombi-Lift Montage- und Handelsgesellschaft mbH. Hydraulic apparatus for the operation of an elevator. 4,317,505, Cl. 187-17.000.

Schnurbusch, Horst; Gras, Rainer; and Wolf, Elmar, to Chemische Werke Huls Aktiengesellschaft. Isocyanatomethyl group containing urea derivatives of 3(4), 8(9)-diisocyanatomethyltricyclo [5.2.1.0^{2,6}] decane, method for their production as well as their use for producing polyurethane elastomers. 4,317,900, Cl. 528-59.000.

Schonberger, Milton. Fever thermometer, or the like sensor. 4,317,367, Cl. 73-362.0AR.

Schroder, Ernst, to Licentia Patent-Verwaltungs-G.m.b.H. Circuit system for the generation of a direct control voltage depending upon an alternating voltage. 4,318,009, Cl. 307-246.000.

Schroll, Craig R.: *See*—
Trocciola, John C.; Schroll, Craig R.; and Vine, Raymond W., 4,317,865, Cl. 429-41.000.
Schubert, Malvin L., to General Motors Corporation. Hydraulic power brake system and hydraulic brake booster and controls therefor. 4,317,332, Cl. 60-547.00R.
Schuessler, Thomas F.; and Melville, Douglas K., to Sherwood Medical Industries Inc. Disposable body fluid collection device. 4,317,525, Cl. 215-1.00C.
Schuh, Peter O.: *See*—
Biggs, Ronald D.; and Schuh, Peter O., 4,317,964, Cl. 179-81.00R.
Schulz, Manfred. Holder for an oxygen lance. 4,317,561, Cl. 266-265.000.
Schulze, Ehrhart; and Berg, Michael, to Stiegler, Karl Heinz. Article-deflecting switching means for a system of article conveyors. 4,317,656, Cl. 493-197.000.
Schulze, Joachim: *See*—
Froscher, Peter; and Schulze, Joachim, 4,317,631, Cl. 356-73.100.
Schwartz, Edwin L.; and Langan, Allen W., to Rite Autotronics Corporation. Pressure relief valve. 4,317,468, Cl. 137-540.000.
Schwarz, Josef: *See*—
Kuhnle, Ernst; and Schwarz, Josef, 4,317,495, Cl. 177-157.000.
Schwerzel, Robert E.: *See*—
Mallozzi, Philip J.; Epstein, Harold M.; Schwerzel, Robert E.; and Campbell, Bernerd E., 4,317,994, Cl. 250-275.000.
Sciffer, Jack P.: *See*—
Sander, Anthony J.; Sciffer, Jack P.; and Whitton, Richard W., 4,317,428, Cl. 118-623.000.
SCM Corporation: *See*—
Sortwell, Daniel R., III, 4,317,840, Cl. 426-100.000.
Scott, Charles E.; Smith, Robert L.; and Bristol, Robert G., to Emhart Industries, Inc. Control system for appliances and the like. 4,318,084, Cl. 340-309.100.
Scott & Fetzer Company, The: *See*—
Knowlton, Christopher M., 4,317,246, Cl. 15-83.000.
Knowlton, Christopher W., 4,317,252, Cl. 15-320.000.
Scovill, John P.: *See*—
Klayman, Daniel L.; Scovill, John P.; Bartosevich, Joseph F.; Mason, Carl J.; and Griffin, T. Scott, 4,317,776, Cl. 260-244.400.
Seabrook Blanching Corporation of Georgia: *See*—
Forrest, James T.; and Thornton, Robert L., 4,317,411, Cl. 99-623.000.
Secim: *See*—
Doudet, Michel, 4,317,352, Cl. 72-255.000.
Seemuth, Paul D., to Ethyl Corporation. Preparation of carbonyl compounds. 4,317,934, Cl. 568-437.000.
Seitchik, Jerold A.; Closson, Thomas A.; Oxford, David B.; and Schenck, Stephen R., to Texas Instruments Incorporated. Phase tolerant magnetic bubble memory sense amplifier. 4,318,187, Cl. 365-8.000.
Sekine, Matsuo: *See*—
Musha, Toshimitsu; Sekine, Matsuo; Kiuchi, Eichi; and Irabu, Takeru, 4,318,101, Cl. 343-5.0CF.
Senders, Henricus H. H., to Kollross, Gunter. Expandable mandrel device for longitudinal shirring of flexible tubular material. 4,317,256, Cl. 17-1.00R.
Sendrow, Marvin. System for authenticating users and devices in on-line transaction networks. 4,317,957, Cl. 178-22.080.
Seneca Sawmill Company: *See*—
Jones, Aaron U.; Trudeau, Marcel R., deceased; and Trudeau, Claire, administratrix, 4,317,398, Cl. 83-156.000.
Senni, Antonio: *See*—
Zaffaroni, Pasquale; Senni, Antonio; and Formiconi, Lamberto, 4,317,884, Cl. 435-247.000.
Sensormatic Electronics Corporation: *See*—
Narlow, Douglas A.; and Stevens, Eugene, 4,318,090, Cl. 340-572.000.
Serafino, John B.; and Kmetz, William A., to Mobil Tyco Solar Energy Corporation. Belt-roller crystal pulling mechanism. 4,317,799, Cl. 422-249.000.
Sernovitz, Morton A., to Market Products, Inc. Illuminated display device. 4,317,303, Cl. 40-564.000.
Shanbhag, Sudhakar P.: *See*—
El-Hag, Nabil A.; and Shanbhag, Sudhakar P., 4,317,842, Cl. 426-302.000.
Shanks, Bruce E., to General Electric Company. Snap in coupling assembly for a vehicle headlamp having a trim rim integral therewith. 4,318,161, Cl. 362-226.000.
Sharon Manufacturing Company: *See*—
Hudson, Sharon J., Jr., 4,317,662, Cl. 55-392.000.
Sharp Kabushiki Kaisha: *See*—
Yoshikawa, Toshihumi; Tani, Zempei; Aso, Akira; and Kawanabe, Hitoshi, 4,318,115, Cl. 357-30.000.
Shaw, Bon F.: *See*—
Marshall, Albert H.; Bond, Gary M.; and Shaw, Bon F., 4,317,651, Cl. 434-22.000.
Marshall, Albert H.; Bond, Gary M.; and Shaw, Bon F., 4,317,652, Cl. 434-22.000.
Shay, Robert H.: *See*—
Kaspersma, Jelle H.; and Shay, Robert H., 4,317,687, Cl. 148-16.500.
Sheer, M. Lana, to Du Pont de Nemours, E. I., and Company. Polybutylene terephthalate molding blends. 4,317,764, Cl. 524-449.000.
Sheldon, Steve S. Plant growth suppression device. 4,317,309, Cl. 47-32.000.
Shell Oil Company: *See*—
Kim, Leo; Paxson, Timm E.; and Tang, Sunny C., 4,317,936, Cl. 568-454.000.
Kooijmans, Petrus G.; and Kunze, Wolfgang, 4,317,757, Cl. 524-541.000.
Lutz, Eugene F., 4,317,938, Cl. 568-619.000.
Shen, Linus L., to Abbott Laboratories. Elastomer instrument. 4,317,363, Cl. 73-64.100.
Shenk, Edwin K., to Polaroid Corporation. Strobe camera having range correlated scanning blade endoding. 4,317,624, Cl. 354-139.000.
Shepel, Michael, to United States of America, Army. Microbial filter assembly. 4,317,726, Cl. 210-236.000.
Shepherd, Glen C., to Texas Instruments Incorporated. Interface relay for high current equipment. 4,318,071, Cl. 337-136.000.
Sheppard, Edward W.: *See*—
Chen, Catherine S. H.; and Sheppard, Edward W., 4,317,893, Cl. 525-328.000.
Sherlaw, Michael, to Crane Co. Seat assembly for butterfly valve. 4,317,558, Cl. 251-306.000.
Sherwood Medical Industries Inc.: *See*—
Schuessler, Thomas F.; and Melville, Douglas K., 4,317,525, Cl. 215-1.00C.
Shiba, Tetsuo; Kotani, Shozo; Yamamura, Yuichi; Nagase, Osamu; and Ogawa, Hidemasa, to Daiichi Seiyaku Co., Ltd. Muramyldipeptide derivatives. 4,317,771, Cl. 260-112.50R.
Shibata, Jyuzo: *See*—
Souma, Hideaki; Konno, Norimitsu; Hosotani, Yohzoh; and Shibata, Jyuzo, 4,317,676, Cl. 75-5.000.
Shibata, Tutomu; Osanai, Akira; Tomabechi, Hideo; and Fujibayashi, Kenji, to Olympus Optical Co., Ltd. Method and apparatus for controlling a microcassette tape transport. 4,318,139, Cl. 360-71.000.
Shibukawa, Mitsuru: *See*—
Horiguchi, Sadayuki; Hasegawa, Akio; and Shibukawa, Mitsuru, 4,317,882, Cl. 435-212.000.
Shigemasa, Yoshimi: *See*—
Nakanishi, Toru; and Shigemasa, Yoshimi, 4,317,878, Cl. 435-10.000.
Shigeta, Yasuo, to Sony Corporation. Video tape reproducing apparatus with various tape speeds. 4,318,140, Cl. 360-73.000.
Shimada, Nobuyuki: *See*—
Kokaji, Norio; and Shimada, Nobuyuki, 4,317,630, Cl. 355-50.000.
Shimada, Shoji: *See*—
Karasawa, Kunihiko; Hosoda, Tokushiro; Mase, Hiroshi; Sato, Yasuo; and Shimada, Shoji, 4,317,845, Cl. 427-47.000.
Shimizu, Kazuma; and Satow, Haruhiko, to Toyo Kogyo Co., Ltd. Apex seal for rotary piston engines with separate sealing and support pieces. 4,317,648, Cl. 418-120.000.
Shimizu, Masami, to Canon Kabushiki Kaisha. Electric circuit protection device for camera. 4,317,628, Cl. 354-288.000.
Shimizu, Toshio; Wakabayashi, Atsushi; and Goto, Shuichi, to Japan Radio Company, Limited. Automatic ground clutter rejection in weather pulse radar system. 4,318,100, Cl. 343-5.00W.
Shin-Etsu Chemical Co. Ltd.: *See*—
Imada, Kiyoshi; Ueno, Susumu; Nishina, Yasuhide; and Nomura, Hirokazu, 4,317,788, Cl. 264-22.000.
Shinku Laboratory Co., Ltd.: *See*—
Saito, Susumu, 4,317,706, Cl. 204-198.000.
Shinomiya, Yoshitugu: *See*—
Ichisaka, Teruo; and Shinomiya, Yoshitugu, 4,317,709, Cl. 204-268.000.
Shipitalo, William M.: *See*—
Jirousek, Norman F.; and Shipitalo, William M., 4,317,498, Cl. 180-70.00R.
Shishkin, Evgeny A.: *See*—
Vasilenko, Vladimir I.; Krakovetsky-Kocherzhinsky, Jury A.; Shishkin, Evgeny A.; and Bojko, Jury A., 4,317,360, Cl. 73-15.00B.
Sholette, William P.: *See*—
Joshi, Ashok V.; Gillotti, Albert L.; and Sholette, William P., 4,317,874, Cl. 429-213.000.
Shoquist, William A., to Andrew Engineering, Inc. Liquid reconditioning system. 4,317,732, Cl. 210-744.000.
Shotbolt, Keith, to British National Oil Corporation, The. Apparatus for use in placing a submarine structure on the sea bed alongside an underwater well and method of drilling a plurality of closely spaced underwater wells. 4,317,488, Cl. 166-351.000.
Shutterly, Harold B., to Westinghouse Electric Corp. Solid state digital audio scrambler system for teletransmission of audio intelligence through a television system. 4,318,125, Cl. 358-121.000.
Shutts, Carl V. Snow removing device. 4,317,250, Cl. 15-244.00R.
SIA Schweizer Schmirgel-und Schleif-Industrie AG: *See*—
Kramis, Jost; and Ackermann, Jakob, 4,317,660, Cl. 51-295.000.
Sicilia, Dominic: *See*—
Walden, Judith; and Sicilia, Dominic, 4,317,337, Cl. 63-3.000.
Siegbert/Fischer, Holzwirt: *See*—
Pfalzer, Lothar; and Siegbert/Fischer, Holzwirt, 4,317,701, Cl. 162-234.000.
Siegel, Edgar: *See*—
Eckstein, Udo; and Siegel, Edgar, 4,317,782, Cl. 260-932.000.
Siegman, Edwin J.; and Yelverton, Roy L., to American Cyanamid Company. Spinning process. 4,317,790, Cl. 264-176.00F.
Siemens Aktiengesellschaft: *See*—
Amtmann, Heribert; and Baeker, Klaus, 4,317,999, Cl. 250-413.000.
Degenhardt, Heinz, 4,318,001, Cl. 250-483.000.
Froscher, Peter; and Schulze, Joachim, 4,317,631, Cl. 356-73.100.
Harbauer, Werner, 4,318,065, Cl. 335-17.000.

Hoffmann, Kurt, 4,318,188, Cl. 365-45.000.
Meyer, Hartmut, 4,318,020, Cl. 310-215.000.
Skafvenstedt, Bengt; and Ahlgren, Sture, 4,318,113, Cl. 346-136.000.
Sonntag, Fritz, 4,318,046, Cl. 328-39.000.
Strasser, Karl, 4,317,864, Cl. 429-36.000.
Winzer, Gerhard; and Auracher, Franz, 4,317,699, Cl. 156-629.000.

Sigle, Jakob: *See*—
Sigle, Rolf; and Sigle, Jakob, 4,317,293, Cl. 36-43.000.

Sigle, Rolf; and Sigle, Jakob. Foot-supporting insole. 4,317,293, Cl. 36-43.000.

Signetics Corporation: *See*—
Koomen, Joannes J. M.; and Salters, Roelof H. W., 4,317,690, Cl. 148-187.000.

Silva Restaurant Equipment Co., Inc.: *See*—
Burgess, Emerson F., 4,317,334, Cl. 62-183.000.

Simm, Wolfgang; Steine, Hans-Theo; and Audemars, Daniel, to Castolin S.A. Safety burner for projecting molten metal powders. 4,317,540, Cl. 239-85.000.

Simonovitch, Chaim, to Abic, Ltd. Derivatives of quinoxaline-1,4-dioxides. 4,317,824, Cl. 424-250.000.

Simpkins, Frederick W.: *See*—
Partridge, Malcolm F.; Simpkins, Frederick W.; and Farrington, Lawrence A., 4,318,134, Cl. 358-287.000.

Singer Company, The: *See*—
Gut, Stanley J., deceased; and Vermillion, Don W., 4,317,253, Cl. 15-390.000.

Sip, Jiri G., to General Electric Company. Snap in coupling assembly for a vehicle headlamp. 4,318,162, Cl. 362-226.000.

Sitzmann, Michael E.; and Gilligan, William H., to United States of America, Navy. N,N,N',N'-Tetrakis(2-fluoro-2,2-dinitroethyl) oxamide and a method of preparation thereof. 4,317,928, Cl. 564-160.000.

Sivachenko, E. W.: *See*—
Sivachenko, Eugene W.; and Broacha, Firoze H., 4,317,350, Cl. 72-177.000.

Sivachenko, Eugene W.; and Broacha, Firoze H., to Sivachenko, E. W. Corrugated plate having variable material thickness and method for making same. 4,317,350, Cl. 72-177.000.

Skafvenstedt, Bengt; and Ahlgren, Sture, to Siemens Aktiengesellschaft. Paper conveying device for a recording unit. 4,318,113, Cl. 346-136.000.

SKF Industrial Trading and Development Company B.V.: *See*—
Verburgh, Martin B.; and van Nederveen, Hans B., 4,317,850, Cl. 427-370.000.

Slinkard, William E.: *See*—
Dalton, Charles A.; and Slinkard, William E., 4,317,927, Cl. 562-535.000.

Sloan Kettering Institute: *See*—
Balis, M. Earl; Higgins, Paul J.; and Salser, Josephine S., 4,317,877, Cl. 435-7.000.

Sloterdijk, Wijtze; Dapper, Gerrit; Verbraak, Cornelis A.; and Kirchner, Willem, to Esmil B.V. Process for simultaneously processing of used metal and/or metal scrap and scrap containing halogenated hydrocarbons. 4,317,800, Cl. 423-1.000.

Small World Exchange, Inc.: *See*—
Johnson, Avery R.; and Harrison, John M., 4,317,960, Cl. 179-18.0BC.
Johnson, Avery R., 4,317,961, Cl. 179-18.0BC.

Smiley, Parker C.: *See*—
O'Neill, Cormac G.; and Smiley, Parker C., 4,318,023, Cl. 310-328.000.

Smith, Andrew L., to Monsanto Company. Soil-resistant yarns. 4,317,859, Cl. 428-389.000.

Smith Kline & French Laboratories Limited: *See*—
Durant, Graham J.; Emmett, John C.; Ganellin, Charon R.; and Prain, Hunter D., 4,317,829, Cl. 424-269.000.

Smith, Morley L., to T. S. Simms & Co. Limited. Hand tools. 4,317,248, Cl. 15-145.000.

Smith, Philip E., to Baxa Corporation. Syringe-type liquid container dispenser adapter. 4,317,448, Cl. 128-272.300.

Smith, Robert L.: *See*—
Scott, Charles E.; Smith, Robert L.; and Bristol, Robert G., 4,318,084, Cl. 340-309.100.

Smith, Robert R.; and Tippit, Guy H., to E-Systems, Inc. Coaxial cable trimmer. 4,317,279, Cl. 30-90.100.

Smith, Samuel C., to United States of America, Navy. Resin purger. 4,317,797, Cl. 422-119.000.

SmithKline Corporation: *See*—
Gleason, John G., 4,317,826, Cl. 424-258.000.
Jain, Tikam C., 4,317,812, Cl. 424-116.000.

Snamprogetti S.p.A.: *See*—
Lagana', Vincenzo, 4,317,786, Cl. 261-112.000.
Lagana', Vincenzo, 4,317,787, Cl. 261-112.000.
Mancini, Giuseppe; Imparato, Luigi; and Berti, Franco, 4,317,780, Cl. 260-410.600.
Zaffaroni, Pasquale; Senni, Antonio; and Formiconi, Lamberto, 4,317,884, Cl. 435-247.000.

Sochon, Henry R.: *See*—
Ambrosio, Thomas J.; Buchman, Henry J.; Rogus, Joseph J.; and Sochon, Henry R., 4,317,446, Cl. 128-218.00R.

Societa Italiana Telecomunicazioni Siemens S.p.A.: *See*—
Rizzi, Luigi, 4,318,007, Cl. 307-44.000.

Societe Anonyme dite: Ateliers et Chantiers de Bretagne-ACB: *See*—
Martin, Jean-Francois; and Drouineau, Michel, 4,317,269, Cl. 29-157.30R.

Societe Anonyme dite Compagnie Generale D'Electricite: *See*—
Le Mehaute, Alain; Rouxel, Jean; and Le Blanc-Soreau, Annie, 4,317,873, Cl. 429-197.000.

Societe D'Assistance Technique Pour Produits Nestle S.A.: *See*—
Brambilla, Edgardo; and Horman, Ian, 4,317,841, Cl. 426-239.000.

Societe des Electrodes et Refractaires Savoie (SERS): *See*—
Boudeau, Jean-Michel; Logue, Michel; and Parisot, Claude, 4,317,951, Cl. 13-18.00C.

Societe Generale de Constructions Electriques et Mecaniques "Alsthom & Cie": *See*—
Warszawski, Bernard, 4,317,867, Cl. 429-42.000.

Societe Generale de Constructions Electriques et Mechaniques "Alsthom et Cie": *See*—
Groult, Pierre; Civier, Danielle; and Prehaut, Jacques, 4,317,789, Cl. 264-105.000.

Soderquist, Jan; and Einarsson, Stefan, to Ingemanssons Ingenjorsbyra AB. Sound insulating building element. 4,317,503, Cl. 181-290.000.

Sohier, Bernard: *See*—
Gielly, Jean-Francois; Lizee, Dominique; and Sohier, Bernard, 4,317,807, Cl. 423-320.000.

Solar Limited, Inc.: *See*—
Bowden, Donald R.; and Novell, Bruce J., 4,317,268, Cl. 29-157.3AH.

Solartron Electronic Group Limited, The: *See*—
Lee, Derek J.; and Livingstone, James L. C., 4,317,650, Cl. 434-16.000.

Solvay & Cie: *See*—
Hubert, Guy; and Michel, Edmond, 4,317,793, Cl. 264-521.000.

Sondermeyer, Jack C., to Peavey, Hartley D. Amplifier system with automatic distortion control. 4,318,053, Cl. 330-281.000.

Sondhaus, Charles A., to Kernforschungsanlage Julich GmbH. Method of and device for irradiating animals. 4,318,000, Cl. 250-455.000.

Sonntag, Fritz, to Siemens Aktiengesellschaft. Digital frequency divider. 4,318,046, Cl. 328-39.000.

Sony Corporation: *See*—
Hamaguchi, Kenji; and Hosoya, Mitsuru, 4,317,958, Cl. 179-1.00G.
Ike, Kazuo; Tachi, Katsuichi; and Kato, Tetsuro, 4,318,146, Cl. 360-107.000.
Kawakami, Ryuichi; and Nakazawa, Kenichi, 4,318,181, Cl. 364-569.000.
Nakamura, Takashi, 4,318,034, Cl. 315-383.000.
Nakamura, Takashi; and Morioka, Yoshihiro, 4,318,124, Cl. 358-51.000.
Nomura, Shigenori, 4,318,147, Cl. 360-119.000.
Okanobu, Taiwa, 4,318,050, Cl. 329-101.000.
Shigeta, Yasuo, 4,318,140, Cl. 360-73.000.
Tatsuzawa, Kaichi, 4,318,119, Cl. 358-8.000.

Sortwell, Daniel R., III, to SCM Corporation. Enrobinc composition for frozen comestibles. 4,317,840, Cl. 426-100.000.

Souda, Shigeru: *See*—
Hirose, Noriyasu; and Souda, Shigeru, 4,317,930, Cl. 564-363.000.

Souma, Hideaki; Konno, Norimitsu; Hosotani, Yohzoh; and Shibata, Jyuzo, to Nippon Steel Corporation. Process for producing sintered iron ore having high reducibility. 4,317,676, Cl. 75-5.000.

Sournies, Francois: *See*—
Labarre, Jean-Francois; Sournies, Francois; van de Grampel, Johan C.; and van der Huizen, Andriaan A., 4,317,773, Cl. 260-239.0EP.

Southwire Company: *See*—
Thomas, O. Leon; and Baughn, Eddie S., 4,317,549, Cl. 242-157.00R.

Spainhour, Carroll D., to Western Electric Co., Inc. Method and apparatus for fabricating lightguide preforms. 4,317,667, Cl. 65-27.000.

Spanel, Abram N.; and Jacobs, David R., to Spanel, Abram N. Method, means, and tufted product. 4,317,419, Cl. 112-266.200.

Sparkes, Clifford S. J. Animal footbath. 4,317,431, Cl. 119-158.000.

Specht, Steven J.; and Kircher, Morton S., to Olin Corporation. Remote-controlled jack for intercell connectors. 4,317,708, Cl. 204-228.000.

Spector, George: *See*—
Bailey, Gregory D.; and Spector, George, 4,317,464, Cl. 132-113.000.
Newman, Caroline; and Spector, George, 4,317,592, Cl. 298-7.000.

Speedshelf International, Inc.: *See*—
Konstant, Anthony N.; and Weider, John J., 4,317,523, Cl. 211-187.000.

Spence, J. Ronald, to Standard Oil Company (Indiana). Dispersants and dispersant viscosity modifiers from oxidized-sulfurized olefins. 4,317,738, Cl. 252-47.500.

Spence, J. Ronald, to Standard Oil Company (Indiana). Aminated sulfurized olefin funtionalized with a boron compound and formaldehyde. 4,317,739, Cl. 252-47.500.

Spence, J. Ronald, to Standard Oil Company (Indiana). Process for preparation of aminated sulfurized olefins using alkaline earth metal compounds. 4,317,772, Cl. 260-132.000.

Spiegelberg, Bernard N., to Gould Inc. Battery vent plug with flame arrestor. 4,317,868, Cl. 429-82.000.

Spin Physics, Inc.: *See*—
Jeffers, Frederick J., 4,318,136, Cl. 360-17.000.

Spongr, Jerry J.: *See*—
Tiebor, John E.; Spongr, Jerry J.; and Dalfonso, Ralph J., 4,317,997, Cl. 250-308.000.

Springer, Helmut: *See*—
Bernhagen, Wolfgang; Weber, Jurgen; Bahrmann, Helmut; and Springer, Helmut, 4,317,945, Cl. 568-853.000.

Weber, Jurgen; Bernhagen, Wolfgang; and Springer, Helmut, 4,317,925, Cl. 562-531.000.
Srivastava, Gopal K.: *See—*
Bart, Stan; and Srivastava, Gopal K., 4,318,036, Cl. 315-408.000.
Stamper, Robin H. Device for the removal of foul air from toilet bowls and the like. 4,317,242, Cl. 4-213.000.
Standard Oil Co., The: *See—*
Suresh, Dev D.; and Grasselli, Robert K., 4,317,747, Cl. 252-469.000.
Standard Oil Company (Indiana): *See—*
Karayannis, Nicholas M.; and Lee, Sam S., 4,317,898, Cl. 526-141.000.
Spence, J. Ronald, 4,317,738, Cl. 252-47.500.
Spence, J. Ronald, 4,317,739, Cl. 252-47.500.
Spence, J. Ronald, 4,317,772, Cl. 260-132.000.
Standard Oil Company (SOHIO): *See—*
Blum, Patricia R.; and Nicholas, Mark L., 4,317,778, Cl. 260-346.750.
Staub, Vincent M., Jr., to General Motors Corporation. Torque converter clutch having a viscous drive portion. 4,317,510, Cl. 192-48.300.
Stauffer Chemical Company: *See—*
Thiele, Gerald H., 4,317,673, Cl. 71-95.000.
Stauffer, Norman L., to Honeywell Inc. Digital auto focus system utilizing a photodetector array. 4,317,991, Cl. 250-201.000.
Stauffer, Norman L., to Honeywell Inc. Object detecting apparatus. 4,317,992, Cl. 250-221.000.
Steadman, Stephen T., to Boeing Company, The. Torque limiter trip indicator. 4,317,424, Cl. 116-56.000.
Steel, Thomas; Hooke, Noel H.; and Pask, George, to Rolls-Royce Limited. Gas turbine engines. 4,317,646, Cl. 415-116.000.
Steer, David C.: *See—*
MacLennan, David G.; Ousby, John C.; Owen, Terence R.; and Steer, David C., 4,317,843, Cl. 426-656.000.
Steigerwald Strahltechnik GmbH: *See—*
Scheffels, Wilhelm; and Hoffmann, Ruprecht, 4,317,983, Cl. 219-121.0EA.
Steinbach, James G., to Deere & Company. Ground-working implement and lift linkage therefor. 4,317,489, Cl. 172-400.000.
Steine, Hans-Theo: *See—*
Simm, Wolfgang; Steine, Hans-Theo; and Audemars, Daniel, 4,317,540, Cl. 239-85.000.
Steiner, Nicolas D., to Steiner Products Limited. Aid for hairdressers. 4,317,462, Cl. 132-45.00R.
Steiner Products Limited: *See—*
Steiner, Nicolas D., 4,317,462, Cl. 132-45.00R.
Stell, Karl-Wilhelm, to Metallumform Hubert Eing. Method of and apparatus for forging a constant-velocity ball-type universal joint. 4,317,356, Cl. 72-355.000.
Stendel, Wilhelm: *See—*
Fuchs, Rainer; Naumann, Klaus; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; and Stendel, Wilhelm, 4,317,834, Cl. 424-304.000.
Stephens, Leonard W.; and Salladay, Mack, to Lane, Perry M. Ratchet wrench. 4,317,392, Cl. 81-63.100.
Sterling Drug Inc.: *See—*
Lesher, George Y.; and Page, Donald F., 4,317,827, Cl. 424-263.000.
Lesher, George Y.; and Brundage, Ruth P., 4,317,909, Cl. 544-127.000.
Stevens, Albert: *See—*
McMullan, James P.; Stevens, Albert; and Metzgar Kenneth J., 4,318,016, Cl. 310-19.000.
Stevens, Eugene: *See—*
Narlow, Douglas A.; and Stevens, Eugene, 4,318,090, Cl. 340-572.000.
Stewart, William S.; Funk, Gary L.; and Huang, Warren H., to Phillips Petroleum Co. Control of a cracking furnace. 4,318,178, Cl. 364-502.000.
Stiegler, Karl Heinz: *See—*
Schulze, Ehrhart; and Berg, Michael, 4,317,656, Cl. 493-197.000.
Stiga AB: *See—*
Malmberg, Gunnar; Andersson, Roger; and Pettersson, Kjell, 4,317,324, Cl. 56-11.300.
Stoeva, Nelly S.: *See—*
Popov, Mitko S.; Djedjeva, Galina M.; Todorov, Ivan O.; and Stoeva, Nelly S., 4,317,883, Cl. 435-234.000.
Stohr, Gunter: *See—*
Kratel, Gunter; Stohr, Gunter; and Scherer, Heinz, 4,317,762, Cl. 523-203.000.
Stokker, Gerald E.: *See—*
Cragoe, Edward J., Jr.; Stokker, Gerald E.; and Gould, Norman P., 4,317,922, Cl. 562-461.000.
Stone, Edward: *See—*
Guagliardo, Matthew; and Stone, Edward, 4,317,895, Cl. 524-500.000.
Stoughton Tool & Die Co., Inc.: *See—*
Castano, Gregory, 4,317,395, Cl. 82-34.00D.
Strack, Hans: *See—*
Voigt, Carl; Strack, Hans; and Kleinschmit, Peter, 4,317,808, Cl. 423-375.000.
Strack, Karl: *See—*
Halene, Clemens; Schlichting, Josef; and Strack, Karl, 4,317,348, Cl. 72-62.000.
Strait, Richard T.: *See—*
Wolf, Alby H.; and Strait, Richard T., 4,317,871, Cl. 429-179.000.
Strandli, Kare R.; Middleton, Thomas; and Fjeldstad, Jarle, to A/S Raufoss Ammunisjonsfabrikker. Detonator element. 4,317,413, Cl. 102-275.900.
Strassel, Albert, to Produits Chimiques Ugine Kuhlmann. Polyvinylidene fluoride-thermoplastic resin laminates and method. 4,317,860, Cl. 428-421.000.
Strasser, Karl, to Siemens Aktiengesellschaft. Battery consisting of a multiplicity of electrochemical cells. 4,317,864, Cl. 429-36.000.
Stratton, Larry J.; Norini, Richard A.; Davis, Peter G.; Dyskievicz, Steve M.; Cowap, Frederic W.; Haskin, Roger L.; Gagner, Mark B.; and Mynett, Thomas M., to HurletronAltair, Inc. Computerized press controls. 4,318,176, Cl. 364-469.000.
Streck, Roland: *See—*
Herrmann, Christoph; and Streck, Roland, 4,317,897, Cl. 526-116.000.
Stroman, Fritz: *See—*
Klingler, Karl-Heinz; Kleemann, Axel; Stroman, Fritz; and Thiemer, Klaus, 4,317,832, Cl. 424-274.000.
Struthers, Ralph C., to Universal Fuel Systems, Inc. Fuel cell. 4,317,863, Cl. 429-19.000.
Studer, Gustav: *See—*
Ebner, Walter; Kramis, Werner; and Studer, Gustav, 4,317,405, Cl. 89-37.00G.
Suganuma, Tsuneo: *See—*
Susa, Kenzo; Matsuyama, Iwao; Satoh, Shin; and Suganuma, Tsuneo, 4,317,668, Cl. 65-29.000.
Sugimoto, Yoshiyuki: *See—*
Kanda, Katsumi; Kondo, Yoshikazu; and Sugimoto, Yoshiyuki, 4,317,857, Cl. 428-334.000.
Sugiura, Taketoshi: *See—*
Tanabe, Zenichi; Fukui, Toshiyasu; Ikeda, Hiroshi; Miura, Tatsuo; and Sugiura, Taketoshi, 4,317,484, Cl. 165-134.00R.
Sullivan, Daniel A. Convertible electrically heated tool for removing wooden or metal golf club heads. 4,317,986, Cl. 219-231.000.
Sullivan, Thomas J., to Fisons Limited. Method for the reduction of excess gastric acid secretion. 4,317,833, Cl. 424-283.000.
Sulzer Brothers Limited: *See—*
Akeret, Hans, 4,317,702, Cl. 376-272.000.
Kohl, Karl, 4,317,342, Cl. 66-120.000.
Sumitomo Chemical Company, Limited: *See—*
Atsumi, Toshio; Sanjiki, Tetsutaro; and Kiyohara, Takao, 4,317,825, Cl. 424-250.000.
Sakaguchi, Iwao; and Hayashi, Yoshiaki, 4,317,908, Cl. 544-74.000.
Takano, Tetsuo; Suzukamo, Gohu; Ishino, Masaru; and Ikimi, Kiyoshi, 4,317,918, Cl. 562-406.000.
Sumitomo Electric Industries, Ltd.: *See—*
Kobayashi, Takashi; and Nitta, Etsurou, 4,317,633, Cl. 356-371.000.
Sumitomo Light Metal Industries, Ltd.: *See—*
Tanabe, Zenichi; Fukui, Toshiyasu; Ikeda, Hiroshi; Miura, Tatsuo; and Sugiura, Taketoshi, 4,317,484, Cl. 165-134.00R.
Sumitomo Naugatuck Co., Ltd.: *See—*
Sakano, Hajime; Ito, Akitoshi; and Terada, Miyuki, 4,317,891, Cl. 525-66.000.
Summers, David A.; Barker, Clark R.; and Keith, H. Dean, to University of Missouri, The Curators of the. Method and apparatus for drilling horizontal holes in geological structures from a vertical bore. 4,317,492, Cl. 175-79.000.
Suresh, Dev D.; and Grasselli, Robert K., to Standard Oil Co., The. Promoted U-Sb-oxide catalysts. 4,317,747, Cl. 252-469.000.
Susa, Kenzo; Matsuyama, Iwao; Satoh, Shin; and Suganuma, Tsuneo, to Hitachi, Ltd. Method for producing silica glass. 4,317,668, Cl. 65-29.000.
Suvorov, Arthur M.: *See—*
Chubarov, Evgeny P.; Kubyshkin, Viktor A.; Mitrofanov, Vladimir E.; Emelyanov, Alexandr N.; Butkovsky, Anatoly G.; Norkin, Kemer B.; Aizenshtein, Anatoly G.; Kolomeitseva, Margarita B.; Suvorov, Arthur M.; and Vazhnov, Sergei A., 4,317,981, Cl. 219-121.0EA.
Suzukamo, Gohu: *See—*
Takano, Tetsuo; Suzukamo, Gohu; Ishino, Masaru; and Ikimi, Kiyoshi, 4,317,918, Cl. 562-406.000.
Suzuki, Fujio: *See—*
Kidoh, Kunizoh; Suzuki, Fujio; and Kushida, Kazuo, 4,317,861, Cl. 428-421.000.
Suzuki, Hideo; and Fujimori, Ryo, to Olympus Optical Co., Ltd. Coloring-decoloring-drying apparatus for electrophoresis. 4,317,710, Cl. 204-299.00R.
Suzuki, Seigo; and Eguchi, Seiji, to Tokyo Shibaura Electric Co., Ltd. Multi-processor system employing job-swapping between different priority processors. 4,318,174, Cl. 364-200.000.
Suzuki, Yasoji; Takada, Minoru; Satoh, Yasushi; and Osanai, Hiroshi, to Tokyo Shibaura Denki Kabushiki Kaisha. MOS Integrated circuit. 4,318,117, Cl. 357-42.000.
Svenska Kassaprinter AB: *See—*
Englund, Roland; and Wincent, Tommy, 4,317,635, Cl. 400-124.000.
Svenska Traforskningsinstitutet: *See—*
Lundqvist, Inge J.; Pettersson, Jan G. T.; and Fladda, Gerdt H., 4,318,180, Cl. 364-555.000.
Swain, Fredrick O.; and Decker, Raymond E., to Mesa Industries, Inc. Floating roof tank sealing methods and apparatus. 4,317,528, Cl. 220-224.000.
Swartzendruber, Ray E., to Chore-Time Equipment, Inc. Auger conveyor tube. 4,317,430, Cl. 119-52.0AF.

Swaziek, Laurence J.: *See*—
Kilts, Harold J.; and Swaziek, Laurence J., 4,317,317, Cl. 52-224.000.
Swette, Larry L. Transcription-copy feeder. 4,317,565, Cl. 271-274.000.
Swiss Aluminium Ltd.: *See*—
Dantzig, Jonathan A.; and Tyler, Derek E., 4,317,679, Cl. 75-93.00E.
Gut, Edwin; Arnold, Erwin; and Friedli, Hans, 4,317,595, Cl. 299-94.000.
Riser, Rene, 4,317,382, Cl. 74-25.000.
Sybron Corporation: *See*—
Blair, James E.; and Davis, Lois T., 4,317,885, Cl. 435-253.000.
Sze, Robert C., to United States of America, Energy. Excimer laser with fluoropolymer lining. 4,318,056, Cl. 372-57.000.
Szebeni, Rudolf: *See*—
Palosi, Endre; Korbonits, Dezso; Kiss, Pal; Gonczy, Csaba; Heja, Gergely; Cser nee Kun, Judit; Szebeni, Rudolf; Szomor nee Wundele, Maria; and Szvoboda nee Kanzel, Ida, 4,317,920, Cl. 562-440.000.
Szomor nee Wundele, Maria: *See*—
Palosi, Endre; Korbonits, Dezso; Kiss, Pal; Gonczy, Csaba; Heja, Gergely; Cser nee Kun, Judit; Szebeni, Rudolf; Szomor nee Wundele, Maria; and Szvoboda nee Kanzel, Ida, 4,317,920, Cl. 562-440.000.
Szvoboda nee Kanzel, Ida: *See*—
Palosi, Endre; Korbonits, Dezso; Kiss, Pal; Gonczy, Csaba; Heja, Gergely; Cser nee Kun, Judit; Szebeni, Rudolf; Szomor nee Wundele, Maria; and Szvoboda nee Kanzel, Ida, 4,317,920, Cl. 562-440.000.
T. S. Simms & Co. Limited: *See*—
Smith, Morley L., 4,317,248, Cl. 15-145.000.
Tabusa, Fujio: *See*—
Ishikawa, Hiroshi; Tabusa, Fujio; and Nakagawa, Kazuyuki, 4,317,820, Cl. 424-246.000.
Tachi, Katsuichi: *See*—
Ike, Kazuo; Tachi, Katsuichi; and Kato, Tetsuro, 4,318,146, Cl. 360-107.000.
Tadanikr, John S.: *See*—
Martin, Jerry R.; Tadanikr, John S.; and Collum, Paulette, 4,317,904, Cl. 536-17.00R.
Taite, Jason; and Ferrari, Leonard A., to Taite, Jason. Interior decor composition and display systems. 4,318,121, Cl. 358-22.000.
Takada, Minoru: *See*—
Suzuki, Yasoji; Takada, Minoru; Satoh, Yasushi; and Osanai, Hiroshi, 4,318,117, Cl. 357-42.000.
Takahashi, Ikuo, to Kabushiki Kaisha Takahashi Engineering. Hydraulic cylinder for generating vibrations. 4,317,406, Cl. 91-39.000.
Takahashi, Minoru: *See*—
Mitsui, Sadao; Takahashi, Minoru; and Watanabe, Keiichi, 4,318,062, Cl. 331-109.000.
Takahashi, Noboru: *See*—
Nishihara, Toshikazu; Isono, Hiromasa; Naruse, Tunehide; Ozaki, Sadao; and Takahashi, Noboru, 4,317,675, Cl. 75-0.5BA.
Takakura, Isamu: *See*—
Saikawa, Isamu; Takano, Shuntaro; Momonoi, Kaishu; Takakura, Isamu; Kuroda, Seietsu; Tanaka, Kiyoshi; Hayashi, Kenshin; Nagahashi, Bunei; and Kutani, Chiaki, 4,317,907, Cl. 544-21.000.
Takanashi, Akihiro: *See*—
Kurosaki, Toshiei; and Takanashi, Akihiro, 4,317,383, Cl. 74-110.000.
Takano, Shuntaro: *See*—
Saikawa, Isamu; Takano, Shuntaro; Momonoi, Kaishu; Takakura, Isamu; Kuroda, Seietsu; Tanaka, Kiyoshi; Hayashi, Kenshin; Nagahashi, Bunei; and Kutani, Chiaki, 4,317,907, Cl. 544-21.000.
Takano, Tetsuo; Suzukamo, Gohu; Ishino, Masaru; and Ikimi, Kiyoshi, to Sumitomo Chemical Co., Ltd. Process for preparir.g alcohols. 4,317,918, Cl. 562-406.000.
Takata, Juichiro. Passive vehicle occupant restraint belt system. 4,317,584, Cl. 280-804.000.
Takeda Chemical Industries, Ltd.: *See*—
Miyashita, Osamu; and Akimoto, Hiroshi, 4,317,821, Cl. 424-248.540.
Talley, Leroy. Portable shoeshine kit. 4,317,519, Cl. 206-577.000.
Tamburrino, Richard A.: *See*—
Penird, Carl W.; and Tamburrino, Richard A., 4,318,025, Cl. 313-404.000.
Tanabe, Yasunosuke: *See*—
Kanda, Shoichi; Oda, Toshikazu; Tanabe, Yasunosuke; and Arai, Takeshi, 4,317,759, Cl. 524-93.000.
Tanabe, Zenichi; Fukui, Toshiyasu; Ikeda, Hiroshi; Miura, Tatsuo; and Sugiura, Taketoshi, to Sumitomo Light Metal Industries, Ltd.; and Nippondenso Co., Ltd. Heat exchanger core. 4,317,484, Cl. 165-134.00R.
Tanaka, Hisao: *See*—
Tsuda, Katsuhiro; Tanaka, Hisao; Nagae, Michio; and Imanaga, Yasuhiko, 4,317,760, Cl. 524-111.000.
Tanaka, Kiyoshi: *See*—
Saikawa, Isamu; Takano, Shuntaro; Momonoi, Kaishu; Takakura, Isamu; Kuroda, Seietsu; Tanaka, Kiyoshi; Hayashi, Kenshin; Nagahashi, Bunei; and Kutani, Chiaki, 4,317,907, Cl. 544-21.000.
Tanaka, Kunihide; Elliott, Michael T.; Chung, Sam; Pau, James; Gray, Linda; Hou, Liping D.; F'Mayer, Mary; Warren, David; and Finch, Karen, to Rockwell International Corporation. Method of fabrication of planar bubble domain device structures. 4,317,700, Cl. 156-652.000.
Tanaka, Taku: *See*—
Yamashita, Shuzo; Tanaka, Taku; Tanii, Hirokuni; Kubotsu, Akira; and Kawai, Syuji, 4,317,729, Cl. 210-500.200.
Tanaka, Taro: *See*—
Noguchi, Masaaki; Tanaka, Yukiyasu; and Tanaka, Taro, 4,317,432, Cl. 123-1.00R.
Tanaka, Yukiyasu: *See*—
Noguchi, Masaaki; Tanaka, Yukiyasu; and Tanaka, Taro, 4,317,432, Cl. 123-1.00R.
Tandler, Peter, to ITT Industries, Inc. Dual-circuit pressure regulator. 4,317,598, Cl. 303-6.00C.
Tang, Sunny C.: *See*—
Kim, Leo; Paxson, Timm E.; and Tang, Sunny C., 4,317,936, Cl. 568-454.000.
Tani, Zempei: *See*—
Yoshikawa, Toshihumi; Tani, Zempei; Aso, Akira; and Kawanabe, Hitoshi, 4,318,115, Cl. 357-30.000.
Tanii, Hirokuni: *See*—
Yamashita, Shuzo; Tanaka, Taku; Tanii, Hirokuni; Kubotsu, Akira; and Kawai, Syuji, 4,317,729, Cl. 210-500.200.
Tanouchi, Tadao; Kawamura, Masanori; and Hayashi, Masaki, to Ono Pharmaceutical Co., Ltd.; and Kissei Pharmaceutical Co., Ltd. Pyridine derivatives. 4,317,828, Cl. 424-263.000.
Tanuma, Itsuo: *See*—
Honda, Toshio; Tanuma, Itsuo; Ogawa, Masao; Ishikawa, Hikaru; Fukuura, Yukio; Akiyama, Setsuo; Ojima, Shozo; and Naito, Kazuo, 4,317,862, Cl. 428-442.000.
Tapco International, Inc.: *See*—
Calvin, Douglas G.; and Babb, Richard C., 4,317,384, Cl. 74-424.80A.
Tateno, Hidenori: *See*—
Kato, Yuzo; Tateno, Hidenori; and Kako, Mikitoshi, 4,317,784, Cl. 261-65.000.
Tatsumi, Susumu: *See*—
Eda, Tadahiro; Tatsumi, Susumu; and Imai, Chikara, 4,318,042, Cl. 324-72.500.
Tatsuzawa, Kaichi, to Sony Corporation. Continuous carrier wave generating circuit. 4,318,119, Cl. 358-8.000.
Taudt, Heinz; Grieger, Dieter; and Beisswenger, Siegfried, to Dr. Ing. Rudolf Hell GmbH. Orifice for coupling an electron beam gun to print form cylinders. 4,317,982, Cl. 219-121.0EN.
Taylor, Julian S. Rupture band relief valve. 4,317,470, Cl. 137-70.000.
Taylor, Paul D.; and Mocella, Michael T., to Atlantic Richfield Company. Recovery of molybdenum from spent catalyst solutions from hydroperoxide epoxidations. 4,317,801, Cl. 423-54.000.
Taylor, Raymond C.: *See*—
Richards, Frank P.; and Taylor, Raymond C., 4,317,323, Cl. 53-563.000.
TDK Electronics Co., Ltd.: *See*—
Mitsui, Sadao; Takahashi, Minoru; and Watanabe, Keiichi, 4,318,062, Cl. 331-109.000.
Teams, Inc.: *See*—
Camp, Douglas M., 4,317,255, Cl. 16-102.000.
Teasley, Granvil E.; and Parker, Allen V. Alternator for wind generator. 4,318,019, Cl. 310-156.000.
Teijin Limited: *See*—
Yamaji, Teizo; and Yoshisato, Eishin, 4,317,742, Cl. 252-188.000.
Teletype Corporation: *See*—
Heeren, Richard H.; and Waggener, Herbert A., 4,317,276, Cl. 29-571.000.
Temperilli, Aldemio; Mantegani, Sergio; Arcari, Giuliana; and Caravaggi, Anna M., to Farmitalia Carlo Erba S.p.A. Tetracyclic indole derivatives. 4,317,912, Cl. 546-199.000.
Tenneco Chemicals, Inc.: *See*—
Haase, Donald J.; Walker, David G.; and Ostrowski, Paul C., 4,317,950, Cl. 585-852.000.
Pcolinsky, Michael P., Jr., 4,317,889, Cl. 521-107.000.
Terada, Miyuki: *See*—
Sakano, Hajime; Ito, Akitoshi; and Terada, Miyuki, 4,317,891, Cl. 525-66.000.
Tewes, Giesbert; and Schmidt-Traub, Henner, to Krupp-Koppers GmbH. Method and system for measuring temperatures in combustion chambers. 4,317,366, Cl. 73-339.00A.
Texaco Inc.: *See*—
Knifton, John F., 4,317,943, Cl. 568-678.000.
Texas A & M University System: *See*—
Milberger, Lionel J.; Denk, Eddie W.; and Hostrup, Kai R., 4,317,490, Cl. 175-20.000.
Texas Instruments Incorporated: *See*—
Guterman, Daniel C.; and Henderson, David L., 4,317,273, Cl. 29-571.000.
Kuo, Chang-kiang; and Tsaur, Shyh-Chang, 4,317,272, Cl. 29-571.000.
Seitchik, Jerold A.; Closson, Thomas A.; Oxford, David B.; and Schenck, Stephen R., 4,318,187, Cl. 365-8.000.
Shepherd, Glen C., 4,318,071, Cl. 337-136.000.
Thatcher, Arthur K.; and McCarter, Ed R., to Thatcher, Arthur K. Single point dispersion system having a low profile carburetor. 4,317,440, Cl. 123-590.000.
Thibodaux, Robert J. Miter board accessory for table saws and the like. 4,317,562, Cl. 269-304.000.
Thiele, Gerald H., to Stauffer Chemical Company. Synergistic herbicidal compositions. 4,317,673, Cl. 71-95.000.
Thiemer, Klaus: *See*—
Klingler, Karl-Heinz; Kleemann, Axel; Stroman, Fritz; and Thiemer, Klaus, 4,317,832, Cl. 424-274.000.

Thiis-Evensen, Eyvind M., to Isola Fabrikker A/S. Roofing shingle. 4,317,853, Cl. 428-80.000.
Thoese, Klaus: *See*—
Scheler, Siegfried; and Thoese, Klaus, 4,317,875, Cl. 430-8.000.
Thomas, James S.; and Eckert, Kim, to Motorola, Inc. High voltage detection circuit. 4,318,013, Cl. 307-362.000.
Thomas, O. Leon; and Baughn, Eddie S., to Southwire Company. Snap in wire guide housing. 4,317,549, Cl. 242-157.00R.
Thomas, Steven L., to General Motors Corporation. Residual magnetism reversing circuit for an electromagnetic clutch. 4,318,155, Cl. 361-156.000.
Thomassen Holland B.V.: *See*—
Hendriks, Rudolf; Oude Alink, Aloysius J. W.; and Van Marle, Berend P., 4,317,658, Cl. 48-61.000.
Thompson, Derry R. Keily drive bushing adapter. 4,317,493, Cl. 175-87.000.
Thomson-CSF: *See*—
Castera, Jean-Paul; and Dupont, Jean-Marie, 4,318,061, Cl. 331-107.00A.
Faure, Michel; and Lumineau, Yves, 4,317,666, Cl. 65-2.000.
Hartemann, Pierre, 4,317,372, Cl. 73-703.000.
Pierrot, Robert; Gautier, Francois; and Crochet, Pierre, 4,318,107, Cl. 343-700.0MS.
Sauvanet, Maurice, 4,318,128, Cl. 358-147.000.
Thornburg, David D.; Flegal, Robert M.; and Lam, Tat C., to Xerox Corporation. Graphics pen for soft displays. 4,318,096, Cl. 340-706.000.
Thornton, Robert L.: *See*—
Forrest, James T.; and Thornton, Robert L., 4,317,411, Cl. 99-623.000.
Thorogood, Peter B., to Burroughs Wellcome Co. Treatment of shock. 4,317,830, Cl. 424-273.00R.
Tiebor, John E.; Spongr, Jerry J.; and Dalfonso, Ralph J., to Twin City International, Inc. Positioning fixture for measuring instruments. 4,317,997, Cl. 250-308.000.
Timbeross, James K.: *See*—
Goodrich, Russell A.; Lengerman, Larry H.; and Timbeross, James K., 4,317,980, Cl. 219-117.100.
Timex Corporation: *See*—
Migeon, Jean P.; and Poix, Claude, 4,318,017, Cl. 310-42.000.
Timken Company, The: *See*—
Faigley, Charles W., Jr., 4,317,601, Cl. 308-202.000.
Timphony, Harold R.; and DeCastro, Rene F., to Nifty Enterprises, Inc. Apparatus for stretching fabric. 4,317,301, Cl. 38-102.000.
Tippit, Guy H.: *See*—
Smith, Robert R.; and Tippit, Guy H., 4,317,279, Cl. 30-90.100.
Tisdale, Lucien E., to Fiber Tech, Inc. Laminated paper load spacer and support. 4,317,517, Cl. 206-597.000.
Todorov, Ivan O.: *See*—
Popov, Mitko S.; Djedjeva, Galina M.; Todorov, Ivan O.; and Stoeva, Nelly S., 4,317,883, Cl. 435-234.000.
Tokuno, Tomotoshi. Wet-type magnetic ore separation apparatus. 4,317,719, Cl. 209-223.00R.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Nakagawa, Noboru; Oonishi, Toshiyuki; Tsutsumi, Masato; and Kawamoto, Akira, 4,317,335, Cl. 62-199.000.
Noda, Tomimitsu, 4,317,976, Cl. 219-10.55F.
Okuhara, Mitsuhiko; Nishino, Taizou; Kawamura, Kazuo; and Aoki, Toshiaki, 4,318,131, Cl. 358-210.000.
Onodera, Toshihiro; Masuda, Youichi; and Nakajima, Akira, 4,318,164, Cl. 363-21.000.
Suzuki, Yasoji; Takada, Minoru; Satoh, Yasushi; and Osanai, Hiroshi, 4,318,117, Cl. 357-42.000.
Tsunoda, Sachio, 4,318,004, Cl. 290-52.000.
Tokyo Shibaura Electric Co., Ltd.: *See*—
Suzuki, Seigo; and Eguchi, Seiji, 4,318,174, Cl. 364-200.000.
Tomabechi, Hideo: *See*—
Shibata, Tutomu; Osanai, Akira; Tomabechi, Hideo; and Fujibayashi, Kenji, 4,318,139, Cl. 360-71.000.
Torok, Gabor P.; and White, Andrew B., to Bell Telephone Laboratories, Incorporated. Remote chalkboard automatic cursor. 4,317,956, Cl. 178-18.000.
Torok, John; McCaffrey, Eugene F.; Riem, Roland H.; and Cheung, Wing S., to Emery Industries, Inc. Process for the preparation of supported nickel catalysts. 4,317,748, Cl. 252-472.000.
Torterotot, Roland M.; and Nasica, Jean R. L. Production of sterile packages. 4,317,321, Cl. 53-426.000.
Towmotor Corporation: *See*—
Jirousek, Norman F.; and Shipitalo, William M., 4,317,498, Cl. 180-70.00R.
Toyama Chemical Co., Ltd.: *See*—
Saikawa, Isamu; Takano, Shuntaro; Momonoi, Kaishu; Takakura, Isamu; Kuroda, Seietsu; Tanaka, Kiyoshi; Hayashi, Kenshin; Nagahashi, Bunei; and Kutani, Chiaki, 4,317,907, Cl. 544-21.000.
Toyo Ink Manufacturing Co. Ltd.: *See*—
Katsura, Hiromitsu; Ehashi, Shigeyuki; Tsuchida, Junichi; and Kakimoto, Kenichi, 4,317,682, Cl. 106-288.00B.
Toyo Kogyo Co., Ltd.: *See*—
Shimizu, Kazuma; and Satow, Haruhiko, 4,317,648, Cl. 418-120.000.
Toyo Kohan Co., Ltd.: *See*—
Kanda, Katsumi; Kondo, Yoshikazu; and Sugimoto, Yoshiyuki, 4,317,857, Cl. 428-334.000.
Toyoda, Mitsuru, to Kabushiki Kaisha Suwa Seikosha. Thin miniaturized dynamic-type loudspeaker. 4,317,965, Cl. 179-115.50R.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Ida, Shiuichiro; Ohshima, Shoichi; and Hirashima, Shunichi, 4,317,386, Cl. 74-467.000.
Katagiri, Masayoshi; and Fujii, Takashi, 4,317,508, Cl. 188-218.00A.
Kato, Yuzo; Tateno, Hidenori; and Kako, Mikitoshi, 4,317,784, Cl. 261-65.000.
Morishita, Teru; and Fukuda, Daiki, 4,317,542, Cl. 239-585.000.
Transco Products, Inc.: *See*—
Kjellberg, Evert, 4,317,972, Cl. 200-153.00S.
Treiber, Robert: *See*—
Cox, John E.; Treiber, Robert; and Cotton, John M., 4,317,962, Cl. 179-18.0ES.
Trident Equipment Limited: *See*—
Balchin, David J., 4,318,151, Cl. 361-45.000.
Trocciola, John C.; Schroll, Craig R.; and Vine, Raymond W., to United Technologies Corporation. Ceria matrix material for molten carbonate fuel cell. 4,317,865, Cl. 429-41.000.
Trocciola, John C.; and Nickols, Richard C., Jr., to United Technologies Corporation. Molten carbonate fuel cell anode. 4,317,866, Cl. 429-41.000.
Troyer, Wade E. Work manipulator. 4,317,560, Cl. 266-48.000.
Trudeau, Claire, administratrix: *See*—
Jones, Aaron U.; Trudeau, Marcel R., deceased; and Trudeau, Claire, administratrix, 4,317,398, Cl. 83-156.000.
Trudeau, Marcel R., deceased: *See*—
Jones, Aaron U.; Trudeau, Marcel R., deceased; and Trudeau, Claire, administratrix, 4,317,398, Cl. 83-156.000.
Tsaur, Shyh-Chang: *See*—
Kuo, Chang-kiang; and Tsaur, Shyh-Chang, 4,317,272, Cl. 29-571.000.
Tsuchida, Junichi: *See*—
Katsura, Hiromitsu; Ehashi, Shigeyuki; Tsuchida, Junichi; and Kakimoto, Kenichi, 4,317,682, Cl. 106-288.00B.
Tsuchiya, Shozo; Sasaki, Makoto; and Hayashi, Hideo, to Nippon Oil Co., Ltd. Offset ink compositions. 4,317,753, Cl. 524-504.000.
Tsuda, Katsuhiro; Tanaka, Hisao; Nagae, Michio; and Imanaga, Yasuhiko, to Dainippon Ink and Chemicals, Inc. Halogen-containing resin composition. 4,317,760, Cl. 524-111.000.
Tsunoda, Sachio, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of pumping up electric power generation and an apparatus therefor. 4,318,004, Cl. 290-52.000.
Tsutsumi, Masato: *See*—
Nakagawa, Noboru; Oonishi, Toshiyuki; Tsutsumi, Masato; and Kawamoto, Akira, 4,317,335, Cl. 62-199.000.
Tullos, Homan C.; and Woods, Dewey W., to Tullos & Woods Tools, Inc. Wireline protector. 4,317,491, Cl. 175-57.000.
Tullos & Woods Tools, Inc.: *See*—
Tullos, Homan C.; and Woods, Dewey W., 4,317,491, Cl. 175-57.000.
Turner, Clarence C., to RCA Corporation. Carrier for rotatably holding kinescope faceplate during processing. 4,317,427, Cl. 118-503.000.
Twin City International, Inc.: *See*—
Tiebor, John E.; Spongr, Jerry J.; and Dalfonso, Ralph J., 4,317,997, Cl. 250-308.000.
Tyler, Derek E.: *See*—
Dantzig, Jonathan A.; and Tyler, Derek E., 4,317,679, Cl. 75-93.00E.
U. D. P., Inc.: *See*—
Conn, Bartley R., 4,317,289, Cl. 33-498.000.
Uchida, Yoshihiro: *See*—
Arichi, Shigeru; and Uchida, Yoshihiro, 4,317,816, Cl. 424-182.000.
Ueno, Susumu: *See*—
Imada, Kiyoshi; Ueno, Susumu; Nishina, Yasuhide; and Nomura, Hirokazu, 4,317,788, Cl. 264-22.000.
Unger, Eberhart, to Gewerkschaft Eisenhutte Westfalia. Mounting for material loading means in a mining tunnelling machine. 4,317,594, Cl. 299-64.000.
Uni-Cardan AG: *See*—
Krude, Werner, 4,317,341, Cl. 64-17.00A.
Uni-Cardan Aktiengesellschaft: *See*—
Krude, Werner; and Muller, Karl-Heinz, 4,317,340, Cl. 64-17.00A.
Union Camp Corporation: *See*—
Eisenhard, Wilmer C., 4,317,740, Cl. 252-49.300.
Union Carbide Corporation: *See*—
Faulring, Gloria M.; and Hilty, Donald C., 4,317,678, Cl. 75-58.000.
Lewis, Irwin C.; and Moore, Arthur W., 4,317,809, Cl. 423-447.100.
Union Oil Company of California: *See*—
Richardson, Ryden L., 4,317,746, Cl. 252-435.000.
United Air Specialists, Inc.: *See*—
Weber, William G., 4,318,152, Cl. 361-92.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
Dore, Marcus J., 4,317,998, Cl. 250-347.000.
United States of America
Air Force: *See*—
Cordova, Ronald J.; Peters, Edmund J.; and Martin, James S., 4,318,137, Cl. 360-32.000.
Davis, Steven J., 4,318,060, Cl. 372-70.000.
Poirier, Joseph L., 4,318,102, Cl. 343-12.00A.
Przyjemski, Joseph M., 4,318,063, Cl. 331-158.000.
Army: *See*—
Klayman, Daniel L.; Scovill, John P.; Bartosevich, Joseph F.; Mason, Carl J.; and Griffin, T. Scott, 4,317,776, Cl. 260-244.400.

Shepel, Michael, 4,317,726, Cl. 210-236.000.
Energy: *See*—
Buchwald, Melvin I.; Jones, Claude R.; and Nelson, Leonard Y., 4,318,057, Cl. 372-70.000.
Sze, Robert C., 4,318,056, Cl. 372-57.000.
FCC: *See*—
Luedtke, Arthur, 4,318,106, Cl. 343-124.000.
Navy: *See*—
Breglia, Denis R.; and Rodemann, Alfred H., 4,317,610, Cl. 350-3.770.
Hsiao, James K., 4,318,099, Cl. 343-5.0SW.
Marshall, Albert H.; Bond, Gary M.; and Shaw, Bon F., 4,317,651, Cl. 434-22.000.
Marshall, Albert H.; Bond, Gary M.; and Shaw, Bon F., 4,317,652, Cl. 434-22.000.
Sitzmann, Michael E.; and Gilligan, William H., 4,317,928, Cl. 564-160.000.
Smith, Samuel C., 4,317,797, Cl. 422-119.000.
U.S. Philips Corp.: *See*—
Bradshaw, Robert F. D.; and Brokenshire, John L., 4,317,995, Cl. 250-288.000.
Hilbourne, Robert A., 4,318,040, Cl. 323-312.000.
Kivits, Petrus J.; de Bont, Marinus R. J.; and de Poorter, Adriaan W., 4,318,112, Cl. 346-135.100.
Peek, Johannes B. H.; Mecklenbrauker, Wolfgang F. G.; Claasen, Theodoor A. C. M.; and van Hurck, Nicolaas, 4,318,086, Cl. 340-347.0AD.
United Technologies Corporation: *See*—
Trocciola, John C.; Schroll, Craig R.; and Vine, Raymond W., 4,317,865, Cl. 429-41.000.
Trocciola, John C.; and Nickols, Richard C., Jr., 4,317,866, Cl. 429-41.000.
Universal Fuel Systems, Inc.: *See*—
Struthers, Ralph C., 4,317,863, Cl. 429-19.000.
University of California, The Regents of the: *See*—
Crooks, Lawrence E.; Hoenninger, John C., III; and Arakawa, Mitsuaki, 4,318,043, Cl. 324-309.000.
Leighton, David L.; and Phleger, Charles F., 4,317,429, Cl. 119-2.000.
University of Missouri, The Curators of the: *See*—
Summers, David A.; Barker, Clark R.; and Keith, H. Dean, 4,317,492, Cl. 175-79.000.
University of Newcastle Research Associates Ltd., The: *See*—
Elfick, Michael H.; and Fletcher, Michael J., 4,317,286, Cl. 33-1.00A.
University of Utah: *See*—
Johnson, Steven A., 4,317,369, Cl. 73-607.000.
UOP Inc.: *See*—
Imai, Tamotsu, 4,317,923, Cl. 562-487.000.
Upjohn Company, The: *See*—
Bundy, Gordon L., 4,317,941, Cl. 568-646.000.
Hofstetter, John R., 4,317,903, Cl. 536-11.000.
Uskokovic, Milan R.: *See*—
Confalone, Pasquale N.; Pizzolato, Giacomo; Uskokovic, Milan R.; and Rouge, Marianne, 4,317,915, Cl. 549-68.000.
Usui, Kenji: *See*—
Hamada, Sumio; Usui, Kenji; and Noguchi, Takeshi, 4,317,705, Cl. 204-1.00T.
Usui Kokusai Sangyo, K.K.: *See*—
Usui, Masayoshi, 4,317,267, Cl. 29-156.70B.
Usui, Masayoshi, to Usui Kokusai Sangyo, K.K. Method for making valve moving push rod for internal combustion engines. 4,317,267, Cl. 29-156.70B.
Uyeda, Tim M.; and Mahnke, Parker E., to Marcy Gymnasium Equipment Co. Single column exercising apparatus. 4,317,566, Cl. 272-118.000.
Van Allen, David, to Polaroid Corporation. Strobe reflector assembly. 4,317,625, Cl. 354-145.000.
van de Grampel, Johan C.: *See*—
Labarre, Jean-Francois; Sournies, Francois; van de Grampel, Johan C.; and van der Huizen, Andriaan A., 4,317,773, Cl. 260-239.0EP.
van der Huizen, Andriaan A.: *See*—
Labarre, Jean-Francois; Sournies, Francois; van de Grampel, Johan C.; and van der Huizen, Andriaan A., 4,317,773, Cl. 260-239.0EP.
van Dijk, Jan; and Zwagemakers, Johannes M. A., to Duphar International Research B.V. Novel basic substituted-alkylidenamino-oxyalkyl-carboxylic acid esters. 4,317,835, Cl. 424-309.000.
Van Espen, Christian: *See*—
Marchal, Claude; and Van Espen, Christian, 4,317,588, Cl. 292-341.140.
Van Gompel, James J., to N. P. Marketing Corporation. Cargo retainer. 4,317,645, Cl. 410-94.000.
Vanguard Diversified, Inc.: *See*—
Baum, Carl M.; and Rohe, William C., 4,317,416, Cl. 108-157.000.
van Hurck, Nicolaas: *See*—
Peek, Johannes B. H.; Mecklenbrauker, Wolfgang F. G.; Claasen, Theodoor A. C. M.; and van Hurck, Nicolaas, 4,318,086, Cl. 340-347.0AD.
Van Marle, Berend P.: *See*—
Hendriks, Rudolf; Oude Alink, Aloysius J. W.; and Van Marle, Berend P., 4,317,658, Cl. 48-61.000.
van Nederveen, Hans B.: *See*—
Verburgh, Martin B.; and van Nederveen, Hans B., 4,317,850, Cl. 427-370.000.
Varen Technology: *See*—
Vaughan, Ronald J., 4,317,949, Cl. 585-458.000.
Varma, Brajendra P., to Gould Inc. Lead acid battery with gel electrolyte. 4,317,872, Cl. 429-190.000.
Vasilenko, Vladimir I.; Krakovetsky-Kocherzhinsky, Jury A.; Shishkin, Evgeny A.; and Bojko, Jury A. Apparatus for differential thermal analysis. 4,317,360, Cl. 73-15.00B.
Vaughan, Ronald J., to Varen Technology. Alkylation process and apparatus useful therein. 4,317,949, Cl. 585-458.000.
Vazhnov, Sergei A.: *See*—
Chubarov, Evgeny P.; Kubyshkin, Viktor A.; Mitrofanov, Vladimir E.; Emelyanov, Alexandr N.; Butkovsky, Anatoly G.; Norkin, Kemer B.; Aizenshtein, Anatoly G.; Kolomeitseva, Margarita B.; Suvorov, Arthur M.; and Vazhnov, Sergei A., 4,317,981, Cl. 219-121.0EA.
VDO Adolf Schindling AG: *See*—
Pudelko, Heinz; and Weber, Klaus, 4,318,075, Cl. 338-162.000.
Veb Gaskombinat Schwarze Pumpe: *See*—
Oberlander, Gerhard; Muller, Reinhard; and Funke, Werner, 4,317,379, Cl. 73-863.120.
VEB Kombinat Polygraph "Werner Lamberz" Leipzig: *See*—
Zimmerman, Hans; Piper, Fritz; Wierth, Gerd; and Nagel, Hartmut, 4,317,563, Cl. 271-211.000.
Veeder Industries, Inc.: *See*—
Kennedy, Paul L., 4,318,018, Cl. 310-156.000.
Verbatim Corporation: *See*—
Majicek, Stepan; and Fitz, Frank A., 4,317,722, Cl. 210-149.000.
Verbraak, Cornelis A.: *See*—
Sloterdijk, Wijtze; Dapper, Gerrit; Verbraak, Cornelis A.; and Kirchner, Willem, 4,317,800, Cl. 423-1.000.
Verburgh, Martin B.; and van Nederveen, Hans B., to SKF Industrial Trading and Development Company B.V. Method for applying a dense, hard, adhesive and wear-resistant layer of cermets or ceramic material on a metal object. 4,317,850, Cl. 427-370.000.
Vermillion, Don W.: *See*—
Gut, Stanley J., deceased; and Vermillion, Don W., 4,317,253, Cl. 15-390.000.
Victor Company of Japan, Limited: *See*—
Machida, Toyotaka, 4,318,132, Cl. 358-228.000.
Nishihara, Toshikazu; Isono, Hiromasa; Naruse, Tunehide; Ozaki, Sadao; and Takahashi, Noboru, 4,317,675, Cl. 75-0.5BA.
Ohtake, Yoshichi, 4,318,133, Cl. 358-229.000.
Victor Equipment Co.: *See*—
Egert, Allen C., 4,317,375, Cl. 73-861.550.
Vine, Raymond W.: *See*—
Trocciola, John C.; Schroll, Craig R.; and Vine, Raymond W., 4,317,865, Cl. 429-41.000.
Vishay Intertechnology, Inc.: *See*—
Zandman, Felix, 4,318,072, Cl. 338-7.000.
Voigt, Carl; Strack, Hans; and Kleinschmit, Peter, to Degussa Aktiengesellschaft. Process for the production of hydrogen cyanide. 4,317,808, Cl. 423-375.000.
Vomish, George W.: *See*—
Chu, Chang K.; and Vomish, George W., 4,317,680, Cl. 75-134.00S.
von Roll AG: *See*—
Willisch, Hannes, 4,317,671, Cl. 71-9.000.
Von De Linde, Dennis J., to Minnesota Mining and Manufacturing Company. Sign cabinet with box beam support frame and clamp assemblies. 4,317,302, Cl. 40-549.000.
Voswinckel, Gerhard, to H. Krantz GmbH & Co. Heat treatment apparatus. 4,317,290, Cl. 34-86.000.
Vrcic, Nicholas. Bat and projectile game. 4,317,571, Cl. 273-341.000.
Vyzkumny ustav bavlnarsky: *See*—
Burysek, Frantisek; and Dykast, Jaroslay, 4,317,545, Cl. 242-18.00A.
W. F. Altenpohl, Inc.: *See*—
Altenpohl, William F.; and Altenpohl, Paul J., 4,317,258, Cl. 17-24.000.
W. R. Grace & Co.: *See*—
Jachimowicz, Felek, 4,317,932, Cl. 564-445.000.
W. S. Dickey Clay Manufacturing Co.: *See*—
Reed, Norman D., 4,317,693, Cl. 156-175.000.
Wacker-Chemie GmbH: *See*—
Kratel, Gunter; Stohr, Gunter; and Scherer, Heinz, 4,317,762, Cl. 523-203.000.
Wada, Kenichi: *See*—
Yamada, Naoki; and Wada, Kenichi, 4,318,172, Cl. 364-200.000.
Waggener, Herbert A.: *See*—
Heeren, Richard H.; and Waggener, Herbert A., 4,317,276, Cl. 29-571.000.
Wagner, Hans: *See*—
Goyert, Wilhelm; Awater, Albert; Grimm, Wolfgang; Ott, Karl-Heinz; Oberkirch, Wolfgang; and Wagner, Hans, 4,317,890, Cl. 525-66.000.
Wagner, Richard C., to Hollymatic Corporation. Molding apparatus. 4,317,259, Cl. 17-32.000.
Wahl, Martha S. Educational blocks. 4,317,653, Cl. 434-211.000.
Wahl, Martha S. Educational blocks. 4,317,654, Cl. 434-211.000.
Waiblinger, Paul: *See*—
Link, Helmut F.; and Waiblinger, Paul, 4,317,394, Cl. 82-2.500.
Wakabayashi, Atsushi: *See*—
Shimizu, Toshio; Wakabayashi, Atsushi; and Goto, Shuichi, 4,318,100, Cl. 343-5.00W.
Walden, Judith; and Sicilia, Dominic. Clasp for glowing liquid filled tubular jewelry. 4,317,337, Cl. 63-3.000.
Walker, David G.: *See*—
Haase, Donald J.; Walker, David G.; and Ostrowski, Paul C., 4,317,950, Cl. 585-852.000.

Wallace Business Forms, Inc.: *See*—
Chang, John C. H., 4,317,743, Cl. 252-316.000.

Ward, Kevin B.: *See*—
Kraushaar, Robert J.; and Ward, Kevin B., 4,317,751, Cl. 252-582.000.

Warner-Lambert Company: *See*—
Nowakoski, John C., 4,317,449, Cl. 128-287.000.

Warren, David: *See*—
Tanaka, Kunihide; Elliott, Michael T.; Chung, Sam; Pau, James; Gray, Linda; Hou, Liping D.; F'Mayer, Mary; Warren, David; and Finch, Karen, 4,317,700, Cl. 156-652.000.

Warshawsky, Abraham; Kalir, Rami; and Patchornik, Abraham, to Yeda Research and Development Co. Ltd. Metal complexing polymers. 4,317,887, Cl. 521-38.000.

Warszawski, Bernard, to Societe Generale de Constructions Electriques et Mecaniques "Alsthom & Cie". Electrode for an electric cell. 4,317,867, Cl. 429-42.000.

Wasserman, Gerald S.: *See*—
Mitchell, William A.; Wasserman, Gerald S.; and Glatz, Alfred C., 4,317,839, Cl. 426-96.000.

Watanabe, Keiichi: *See*—
Mitsui, Sadao; Takahashi, Minoru; and Watanabe, Keiichi, 4,318,062, Cl. 331-109.000.

Watanabe, Seizaburo; and Yamagishi, Tsukasa, to Asahi-Dow Limited. Process for manufacturing an olefin resin foam. 4,317,888, Cl. 521-79.000.

Watanabe Sokki Kabushiki Kaisha: *See*—
Iino, Kinzo; Ohta, Ken-Ichiro; and Aibe, Hiroshi, 4,318,110, Cl. 346-32.000.

Watanabe, Tsuyoshi; Murase, Hidetoshi; Murayama, Akira; and Nakasugi, Mikio, to Canon Kabushiki Kaisha. Method of making an elastic roller. 4,317,270, Cl. 29-447.000.

Watson, Thomas H.: *See*—
Galasan, Felixberto A.; Watson, Thomas H.; and Barkhimer, Robert L., 4,317,415, Cl. 105-378.000.

Weathers, Paul. Planar antenna with tightly wound folded sections. 4,318,109, Cl. 343-806.000.

Webby, Charles W. Remote water cooled heat engine. 4,317,333, Cl. 60-649.000.

Weber, Jurgen; Bernhagen, Wolfgang; and Springer, Helmut, to Ruhrchemie Aktiengesellschaft. Process for the production of di-n-propylacetic acid. 4,317,925, Cl. 562-531.000.

Weber, Jurgen: *See*—
Bernhagen, Wolfgang; Weber, Jurgen; Bahrmann, Helmut; and Springer, Helmut, 4,317,945, Cl. 568-853.000.

Weber, Klaus: *See*—
Pudelko, Heinz; and Weber, Klaus, 4,318,075, Cl. 338-162.000.

Weber, Ralph; Elsner, Emil; Maschlanka, Walter; Rollinger, Bernt; and Sanders, Gerhard, to Korf-Stahl AG. Process for producing liquid crude iron and reduction gas. 4,317,677, Cl. 75-43.000.

Weber, William G., to United Air Specialists, Inc. Digital high voltage monitor and display for electrostatic precipitators. 4,318,152, Cl. 361-92.000.

Weider, John J.: *See*—
Konstant, Anthony N.; and Weider, John J., 4,317,523, Cl. 211-187.000.

Weidler, Charles H. Universal tripod for supporting a camera or the like. 4,317,552, Cl. 248-168.000.

Weiner, Norbert. Flat-type transformer. 4,318,067, Cl. 336-90.000.

Weisman, Alan. Transmission safety device. 4,317,509, Cl. 192-4.00A.

Welch, Thomas R. Keyless chucking system. 4,317,578, Cl. 279-60.000.

Wells, Peter M., Jr., to Ideal Industries, Inc. Releasable cable clamp. 4,317,262, Cl. 24-16.0PB.

Welsch, Wolfgang: *See*—
Rech, Werner; Welsch, Wolfgang; and Zimlich, Josef, 4,318,024, Cl. 313-220.000.

Western Control Equipment Co.: *See*—
McMullan, James P.; Stevens, Albert; and Metzgar Kenneth J., 4,318,016, Cl. 310-19.000.

Western Electric Company, Incorporated: *See*—
Asar Madhu P.; and Greene, Richard A., 4,317,695, Cl. 156-353.000.
Spainhour, Carroll D., 4,317,667, Cl. 65-27.000.

Westinghouse Electric Corp.: *See*—
Chu, Chang K.; and Vomish, George W., 4,317,680, Cl. 75-134.00S.
Dooley, Thomas E.; and Morton, Edward W., 4,318,160, Cl. 362-216.000.
Down, Michael G., 4,317,659, Cl. 48-209.000.
Eley, Edgar R., 4,318,150, Cl. 361-41.000.
Frank, William E.; and Billman, Erwin A., 4,317,979, Cl. 219-10.770.
Golota, John H., 4,317,973, Cl. 200-153.00P.
Hopwood, Francis W.; Muhlbaier, John P.; Oakes, Jeffrey T.; and Haynes, James T., 4,318,055, Cl. 331-12.000.
Quan, Wing C.; and Ludwig, Richard H., 4,317,506, Cl. 187-29.00R.
Sattler, Frank A., 4,317,858, Cl. 428-379.000.
Shutterly, Harold B., 4,318,125, Cl. 358-121.000.

Weststrate, Marinus H.; and Willemsen, Jan, to Expert N.V. Rotatable drum drive. 4,317,291, Cl. 34-103.000.

Whalen, Michael J.: *See*—
Rank, William J.; and Whalen, Michael J., 4,318,157, Cl. 361-386.000.

Wheten, Charles E., to General Motors Corporation. Blow-off apparatus for articles within tumbling barrel. 4,317,426, Cl. 118-418.000.

White, Andrew B.: *See*—
Torok, Gabor P.; and White, Andrew B., 4,317,956, Cl. 178-18.000.

White, James M., to International Business Machines Corporation. Electronic color separation. 4,318,122, Cl. 358-41.000.

Whiteside, Arliss E.; and Wolber, William G., to Bendix Corporation, The. Method and apparatus for conversion of signal information between analog and digital forms. 4,318,085, Cl. 340-347.0DA.

Whiteside, Arliss E.: *See*—
Freedman, Morris D.; Whiteside, Arliss E.; and Rothschild, Alexander M., 4,318,173, Cl. 364-200.000.

Whitfield, John H., to Dais Corporation. Dynamic climatic condition indicating system. 4,318,076, Cl. 340-27.0NA.

Whitton, Richard W.: *See*—
Sander, Anthony J.; Sciffer, Jack P.; and Whitton, Richard W., 4,317,428, Cl. 118-623.000.

Widder Corporation: *See*—
Krieg, Adrian H., 4,317,280, Cl. 30-92.000.

Wiebe, Koning, to Machinefabriek en Technische Handelsonderneming M. H. Van Der Graaf BV. Centrifugal clutch. 4,317,513, Cl. 192-105.00A.

Wierth, Gerd: *See*—
Zimmerman, Hans; Piper, Fritz; Wierth, Gerd; and Nagel, Hartmut, 4,317,563, Cl. 271-211.000.

Wilder, William D.: *See*—
Clark, Reginald H.; MacArthur, John D.; Sayer, Michael; and Wilder, William D., 4,317,521, Cl. 209-558.000.

Wilhelm Hedrich Vakuumanlagen GmbH & Co. KG: *See*—
Hauser, Erhard, 4,317,647, Cl. 417-339.000.

Wilkesmann, Helmut, to Krauss-Maffei Aktiengesellschaft. Wobble centrifuge. 4,317,728, Cl. 210-370.000.

Wilkomirsky, Igor A. E.; Boorman, Roy S.; and Salter, Robert S., to Provincial Holdings Ltd. Recovery of non-ferrous metals by thermal treatments of solutions containing non-ferrous and iron sulphates. 4,317,803, Cl. 423-99.000.

Willemsen, Jan: *See*—
Weststrate, Marinus H.; and Willemsen, Jan, 4,317,291, Cl. 34-103.000.

Willenbring, Armer J.; Osby, Warren J.; and Gausman, James W., to Pako Corporation. Film tray assembly for photographic film cutter. 4,317,564, Cl. 271-223.000.

Williams, Alverson B.: *See*—
Alt, Robert D.; Richardson, James H.; and Williams, Alverson B., 4,317,497, Cl. 180-68.500.

Williams, Bernard L., to Ortho Pharmaceutical Corporation. Drug delivery system. 4,317,447, Cl. 128-260.000.

Williams, Michael R., to FMC Corporation. Wear resistant pump packing cup. 4,317,408, Cl. 92-241.000.

Willisch, Hannes, to von Roll AG. Process of composting refuse or refuse/sewage sludge mixtures by thermal retting. 4,317,671, Cl. 71-9.000.

Wilson, Robert E., to RCA Corporation. Switch closure sensing circuit. 4,318,087, Cl. 340-365.00S.

Wilson, Robert L., to Hewlett-Packard Company. Dual heater stabilization apparatus and method for a crystal oven. 4,317,985, Cl. 219-210.000.

Wilson, Rosser L. Air brake leak locator. 4,317,988, Cl. 235-92.0MT.

Wincent, Tommy: *See*—
Englund, Roland; and Wincent, Tommy, 4,317,635, Cl. 400-124.000.

Winger, Timothy M., to Novelty Manufacturing Company. Wreath hanger. 4,317,554, Cl. 248-205.00A.

Wink, Randall: *See*—
Fuchs, Gilbert; Crowley, Norman; and Wink, Randall, 4,317,694, Cl. 156-256.000.

Winkler, Jiri; and Cibulka, Josef, to CKD PRAHA, Oborovy podnik. Method of three commutation on rectifiers and of inverted electric current converters. 4,318,171, Cl. 363-138.000.

Winzer, Gerhard; and Auracher, Franz, to Siemens Aktiengesellschaft. Method for manufacture of branch element. 4,317,699, Cl. 156-629.000.

Wirtgen, Reinhard. Method and apparatus for abrading and recoating road pavements. 4,317,642, Cl. 404-72.000.

Wisebaker, Dale A., to National Machinery Company, The. Blank rejector for forging machine. 4,317,354, Cl. 72-339.000.

Wittmann, Erwin J.: *See*—
Harwood, Leopold A.; and Wittmann, Erwin J., 4,318,051, Cl. 330-254.000.

Wittwer, Ulrich: *See*—
Riegler, Hannes; and Wittwer, Ulrich, 4,317,969, Cl. 200-52.00R.

Witzel, Frank: *See*—
Kehoe, Gary; Puglia, Wayne J.; Witzel, Frank; Friello, Dominick R.; and Mackay, Donald A. M., 4,317,837, Cl. 426-3.000.

Woellner-Werke: *See*—
Neser, Rudolf P., 4,317,851, Cl. 427-426.000.

Wojcikowski, Richard J., to Dana Corporation. Gear wheel with vibration damping rings. 4,317,388, Cl. 74-574.000.

Wolber, William G.: *See*—
Whiteside, Arliss E.; and Wolber, William G., 4,318,085, Cl. 340-347.0DA.

Wolf, Alby H.; and Strait, Richard T., to Gould Inc. Battery side terminal assembly. 4,317,871, Cl. 429-179.000.

Wolf, Elmar: *See*—
Schnurbusch, Horst; Gras, Rainer; and Wolf, Elmar, 4,317,900, Cl. 528-59.000.

Wolf, Manfred, to Concast AG. Method for preventing damage to strand guide elements of a continuous casting installation for steel. 4,317,482, Cl. 164-454.000.

Wolfinger, John F., to General Electric Company. Torsional vibration monitor. 4,317,371, Cl. 73-650.000.

Wollensak, John C.; Ihrman, Kryn G.; and Jarema, Chester P., to Ethyl Corporation. Process for rearrangement of alkyl groups on aromatic amines. 4,317,931, Cl. 564-409.000.

Woltersdorf, Otto W., Jr.; and Cragoe, Edward J., Jr., to Merck & Co., Inc. 3-Amino-5-substituted-6-halo-N-(3,4-dihydro-6-substituted-1,3,5-triazin-2-yl)2-pyrazinecarboxamides. 4,317,822, Cl. 424-249.000.

Wood, Robert J.; and Mitchell, John F., to General Electric Company. Logic circuit monitor. 4,318,093, Cl. 340-644.000.

Woods, Dewey W.: *See*—
Tullos, Homan C.; and Woods, Dewey W., 4,317,491, Cl. 175-57.000.

Worley, Arthur C., to Exxon Research & Engineering Co. Bottom (coker) burner vessel. 4,317,798, Cl. 422-144.000.

Wright, Bruce M.: *See*—
Roberts, Thomas E., Jr.; Abbott, John A.; and Wright, Bruce M., 4,317,731, Cl. 210-741.000.

Wright, Christopher G.: *See*—
Harvey, Charles J.; and Wright, Christopher G., 4,317,385, Cl. 74-436.000.

Wright, Martin E. J.: *See*—
Barker, Clinton B.; and Wright, Martin E. J., 4,317,576, Cl. 277-235.00B.

Wrinkle, Donald R. Drag adjustment device for fishing reels. 4,317,377, Cl. 73-862.420.

Wynn, Woodson D., to Bell Telephone Laboratories, Incorporated. Magnetic bubble memory with detector. 4,318,186, Cl. 365-8.000.

Xerox Corporation: *See*—
Allis, Robert F.; Kingsley, William; and Allis, Robert F., 4,318,135, Cl. 358-294.000.
Damouth, David E., 4,318,111, Cl. 346-75.000.
Hume, James G., 4,317,636, Cl. 400-208.000.
Thornburg, David D.; Flegal, Robert M.; and Lam, Tat C., 4,318,096, Cl. 340-706.000.

Xhonneux, Gilberte M. J. Water purification equipment. 4,317,733, Cl. 210-752.000.

Yagi, Shizuo; Otani, Junji; Ikenoya, Yasuo; and Kogure, Hiroshi, to Honda Giken Kogyo Kabushiki Kaisha. High power output engine. 4,317,438, Cl. 123-432.000.

Yagi, Yoshiaki; Kouno, Kageaki; and Inui, Taiji, to Sanraku-Ocean Co., Ltd. Process for producing cyclodextrins. 4,317,881, Cl. 435-97.000.

Yamada, Naoki; and Wada, Kenichi, to Hitachi, Ltd. Store data buffer control system. 4,318,172, Cl. 364-200.000.

Yamagishi, Tsukasa: *See*—
Watanabe, Seizaburo; and Yamagishi, Tsukasa, 4,317,888, Cl. 521-79.000.

Yamaji, Teizo; and Yoshisato, Eishin, to Teijin Limited. Oxygen scavenger composition, heat-generating composition and heat-generating structure. 4,317,742, Cl. 252-188.000.

Yamamura, Yuichi: *See*—
Shiba, Tetsuo; Kotani, Shozo; Yamamura, Yuichi; Nagase, Osamu; and Ogawa, Hidemasa, 4,317,771, Cl. 260-112.50R.

Yamashita, Shuzo; Tanaka, Taku; Tanii, Hirokuni; Kubotsu, Akira; and Kawai, Syuji, to Kuraray Co., Ltd. Ethylene-vinyl alcohol copolymer hollow fiber membranes and method of producing same. 4,317,729, Cl. 210-500.200.

Yan, Tsoung Y., to Mobil Oil Corporation. Coprocessing of residual oil and coal. 4,317,711, Cl. 208-8.0LE.

Yasui, Shozui, to M. Yasui & Co. Ltd. Archery mounting device and sight support. 4,317,288, Cl. 33-265.000.

Yasunari, Kenjiro, to Hitachi, Ltd. Method of producing a semiconductor device. 4,317,274, Cl. 29-571.000.

Yeda Research and Development Co. Ltd.: *See*—
Warshawsky, Abraham; Kalir, Rami; and Patchornik, Abraham, 4,317,887, Cl. 521-38.000.

Yelverton, Roy L.: *See*—
Siegman, Edwin J.; and Yelverton, Roy L., 4,317,790, Cl. 264-176.00F.

Yohpe, William E.: *See*—
Roettele, Donald L.; and Yohpe, William E., 4,318,103, Cl. 343-18.00E.

Yokoyama, Kenji, to Nippon Gakki Seizo Kabushiki Kaisha. Input circuit of audio amplifier. 4,318,054, Cl. 330-302.000.

Yokoyama, Masayoshi, to Kabushiki Kaisha Top. Electrode apparatus for pacing. 4,317,458, Cl. 128-784.000.

Yonezawa, Keitaro; and Kitaura, Ichiro. Die lifter unit for pressing or punching machine. 4,317,358, Cl. 72-448.000.

Yonkers, Edward: *See*—
Pepicelli, Pasquale L.; and Yonkers, Edward, 4,317,603, Cl. 312-9.000.

Yoo, Jin S.: *See*—
Burk, Emmett H., Jr.; Yoo, Jin S.; and Karch, John A., 4,317,713, Cl. 208-113.000.

Yoshida, Hajime, to Hajime Industries, Ltd. Data processing system utilizing analog memories having different data processing characteristics. 4,318,080, Cl. 340-146.30Q.

Yoshida, Hajime, to Hajime Industries Ltd. Object inspection system. 4,318,081, Cl. 340-146.30H.

Yoshida, Hirokazu: *See*—
Mizukawa, Takumi; Amagami, Keizo; Kiuchi, Mitsuyuki; Yoshida, Hirokazu; and Saka, Tatsuo, 4,317,975, Cl. 219-10.49R.

Yoshida, Kouichirou: *See*—
Kawasaki, Hironobu; Yoshida, Kouichirou; and Itoh, Tomoo, 4,317,766, Cl. 524-101.000.

Yoshikawa, Toshihumi; Tani, Zempei; Aso, Akira; and Kawanabe, Hitoshi, to Sharp Kabushiki Kaisha. Dual junction photoelectric semiconductor device. 4,318,115, Cl. 357-30.000.

Yoshino Kogyosho Co., Ltd.: *See*—
Saito, Tadao; Kishi, Takao; and Kakuta, Yoshiyuki, 4,317,531, Cl. 222-321.000.

Yoshisato, Eishin: *See*—
Yamaji, Teizo; and Yoshisato, Eishin, 4,317,742, Cl. 252-188.000.

Young, Jay M. Extendable roof for recreational vehicle. 4,317,590, Cl. 296-176.000.

Yowa, Anthony. Nut opener. 4,317,281, Cl. 30-120.200.

Yukl, Tex N., to Near Field Technology Co. Bidirectionally focusing antenna. 4,318,108, Cl. 343-753.000.

Zaffaroni, Pasquale; Senni, Antonio; and Formiconi, Lamberto, to Snamprogetti S.p.A. Method for the production of yeast on ethanol and means therefor. 4,317,884, Cl. 435-247.000.

Zahid, Abduz, to Greer Hydraulics Incorporated. Replaceable bladder accumulator device. 4,317,472, Cl. 138-30.000.

Zandman, Felix, to Vishay Intertechnology, Inc. Precision resistor with improved temperature characteristics. 4,318,072, Cl. 338-7.000.

Zaninelli, Ettore, to Baruffaldi Frizioni S.p.A. Revolving tool carrying turret for lathes. 4,317,396, Cl. 82-36.00A.

Zeis, Jurgen, to Licentia Patent-Verwaltungs-G.m.b.H. Arrangement including a delayed-action semiconductor switch. 4,318,011, Cl. 307-300.000.

Zengel, Hans; and Bergfeld, Manfred, to Akzona Incorporated. Process for the preparation of nitrosobenzene. 4,317,947, Cl. 568-949.000.

Zenith Radio Corporation: *See*—
Amaro, David, 4,318,037, Cl. 315-411.000.
Bart, Stan; and Srivastava, Gopal K., 4,318,036, Cl. 315-408.000.

Ziemke, Robert A.: *See*—
Heckelman, James D.; and Ziemke, Robert A., 4,318,005, Cl. 307-10.0AT.

Zimlich, Josef: *See*—
Rech, Werner; Welsch, Wolfgang; and Zimlich, Josef, 4,318,024, Cl. 313-220.000.

Zimmerman, Hans; Piper, Fritz; Wierth, Gerd; and Nagel, Hartmut, to VEB Kombinat Polygraph "Werner Lamberz" Leipzig. Blowing device in sheet deliverers of sheet processing machines. 4,317,563, Cl. 271-211.000.

Zirnite, Richard N.: *See*—
Beede, Charles H.; and Zirnite, Richard N., 4,317,681, Cl. 106-85.000.

Zmokly, Tadeusz; and Porcher, Alain. Label for the identification of animals or objects. 4,317,990, Cl. 235-494.000.

Zupancic, Viktor; and Miklavcic, Joze. Machine. 4,317,634, Cl. 366-1.000.

Zwagemakers, Johannes M. A.: *See*—
van Dijk, Jan; and Zwagemakers, Johannes M. A., 4,317,835, Cl. 424-309.000.

Zwirn, Robert, to Hughes Aircraft Company. Automatic level and gain control system. 4,318,129, Cl. 358-174.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 2ND DAY OF MARCH, 1982

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Alberto-Culver Company: *See*—
Dasher, George F.; O'Cull, Kathleen A.; and Schamper, Thomas J., Re. 30,874, Cl. 132-7.000.

Anderson, Howard A., to Cities Service Company. Foot operated container and closure device. Re. 30,875, Cl. 220-263.000.

Caisley, Jack B. Jacking assembly. Re. 30,876, Cl. 254-106.000.

Cities Service Company: *See*—
Anderson, Howard A., Re. 30,875, Cl. 220-263.000.

Dasher, George F.; O'Cull, Kathleen A.; and Schamper, Thomas J., to Alberto-Culver Company. Quaternary ammonium compounds in pretreatment of hair before shampooing with an anionic shampoo. Re. 30,874, Cl. 132-7.000.

O'Cull, Kathleen A.: *See*—
Dasher, George F.; O'Cull, Kathleen A.; and Schamper, Thomas J., Re. 30,874, Cl. 132-7.000.

Schamper, Thomas J.: *See*—
Dasher, George F.; O'Cull, Kathleen A.; and Schamper, Thomas J., Re. 30,874, Cl. 132-7.000.

Worrallo, Anthony C. Hinge structures. Re. 30,873, Cl. 16-354.000.

LIST OF PLANT PATENTEES

Harjung, Cameron: *See*—
Harjung, Milton K.; and Harjung, Cameron, 4,828, Cl. 45.000.

Harjung, Milton K.; and Harjung, Cameron. Variegated lemon tree. 4,828, 3-2-82, Cl. 45.000.

LIST OF DESIGN PATENTEES

AGFA-Gevaert AG: *See*—
Schultes, Herbert; and Segers, Hermann R., 263,240, Cl. D16-6.000.

Akita, Tsugio, to Matsushita Electric Industrial Co., Ltd. Vacuum cleaner. 263,235, 3-2-82, Cl. D32-22.000.

Alger, Andrew L., to UARCO Incorporated. Deleaver or similar article. 263,227, 3-2-82, Cl. D14-110.000.

American Home Products Corporation: *See*—
Kelly, Roger L., 263,197, Cl. D8-39.000.

Anaren Microwave, Incorporated: *See*—
Rehnmark, Stig L., 263,226, Cl. D14-87.000.

Anderson, Robert E.; and Fazio, Vincent A. Spiral meat slicer. 263,237, 3-2-82, Cl. D15-97.000.

Arai, Noriyuki: *See*—
Kurokawa, Koya; Arai, Noriyuki; Takahashi, Hideo; and Saeki, Taisuke, 263,220, Cl. D14-2.000.
Kurokawa, Koya; Arai, Noriyuki; Takahashi, Hideo; and Saeki, Taisuke, 263,223, Cl. D14-02.000.

Ball Corporation: *See*—
Haag, John J., Sr., 263,203, Cl. D9-370.000.

Beals, Matthew E., to Falcon Products Incorporated. Support leg for furniture. 263,189, 3-2-82, Cl. D6-195.000.

Bendix Corporation, The: *See*—
Horsting, John J., 263,214, Cl. D13-1.000.
Horsting, John J., 263,215, Cl. D13-1.000.

Bickley, Robert H.; Duddles, Allen L.; Skalka, Robert J.; Rezek, John R.; and Larson, Kenneth W., to Motorola Inc. Front panel for a communication system analyzer or similar article. 263,207, 3-2-82, Cl. D10-80.000.

Blanchard, Russell O.; Guzek, Joseph; and Matt, Donald A., to Motor Wheel Corporation. Wheel. 263,213, 3-2-82, Cl. D12-209.000.

Bonser, Robert D. Multiple level chess board. 263,245, 3-2-82, Cl. D21-23.000.

Boyd, Robert H. Bucket lid opening tool. 263,198, 3-2-82, Cl. D8-40.000.

Brine, William H., Jr. Ball playing stick. 263,248, 3-2-82, Cl. D21-210.000.

Brooks, Arthur J.; Hodlewsky, William G.; and Schroeder, Roger H., to Rexnord Inc. Chain link for a conveyor chain. 263,211, 3-2-82, Cl. D34-29.000.

Capps, William T. Chart drive clock case. 263,209, 3-2-82, Cl. D10-103.000.

Champion International Corporation: *See*—
Dutcher, Daniel P., 263,204, Cl. D9-433.000.

Cohen, Barry: *See*—
Cohen, Harry, 263,188, Cl. D6-184.000.

Cohen, Harry, to Cohen, Barry. Combined magazine stand and cable TV channel selector holder. 263,188, 3-2-82, Cl. D6-184.000.

Corning Glass Works: *See*—
LeVan, Kenneth R., 263,192, Cl. D7-39.000.

Creamer, Joan K., to Dart Industries Inc. Reminder clip or the like. 263,243, 3-2-82, Cl. D19-34.000.

Cyborex Laboratories, Inc.: *See*—
Maher, Frank, 263,216, Cl. D13-4.000.

Daily Prayer Company: *See*—
Van Linden, James E.; and Van Linden, Betty J., 263,178, Cl. D6-2.000.

Dart Industries Inc.: *See*—
Creamer, Joan K., 263,243, Cl. D19-34.000.

Davis, Donald E.: *See*—
Nitz, Frederick P.; Passi, Paul J.; Hodson, Donald R.; and Davis, Donald E., 263,228, Cl. D15-5.000.
Nitz, Frederick P.; Passi, Paul J.; Hodson, Donald R.; and Davis, Donald E., 263,229, Cl. D15-5.000.
Nitz, Frederick P.; Passi, Paul J.; Hodson, Donald R.; and Davis, Donald E., 263,230, Cl. D15-5.000.

Davis, Donald F.: *See*—
Nitz, Frederick P.; Passi, Paul J.; Hodson, Donald R.; and Davis, Donald F., 263,231, Cl. D15-5.000.

Dickinson, Sydney L. Applicator spoon. 263,196, 3-2-82, Cl. D7-140.000.

Dolwani, Ramesh. Oil cooler. 263,232, 3-2-82, Cl. D15-5.000.

Driscoll, Edward K., to Honeywell Information Systems Inc. Disk cartridge. 263,222, 3-2-82, Cl. D14-11.000.

Duddles, Allen L.: *See*—
Bickley, Robert H.; Duddles, Allen L.; Skalka, Robert J.; Rezek, John R.; and Larson, Kenneth W., 263,207, Cl. D10-80.000.

Duracell International Inc.: *See*—
Thomson, Ernest F., 263,257, Cl. D26-42.000.

Dutcher, Daniel P., to Champion International Corporation. Article carrier blank. 263,204, 3-2-82, Cl. D9-433.000.
Falcon Products Incorporated: *See—*
Beals, Matthew E., 263,189, Cl. D6-195.000.
Fazio, Vincent A.: *See—*
Anderson, Robert E.; and Fazio, Vincent A., 263,237, Cl. D15-97.000.
Finn, Raymond R. Base for a holddown and retaining device component. 263,200, 3-2-82, Cl. D8-333.000.
Finn, Raymond R. Holddown and retaining device component. 263,201, 3-2-82, Cl. D8-333.000.
General Mills, Inc.: *See—*
Manderfield, Ellen B., 263,195, Cl. D7-137.000.
Getter, Byron J., to Wolverine World Wide, Inc. Hog carcass shaver. 263,259, 3-2-82, Cl. D30-99.000.
Gibbs, Richard B. Suitcase. 263,177, 3-2-82, Cl. D3-71.000.
Guzek, Joseph: *See—*
Blanchard, Russell O.; Guzek, Joseph; and Matt, Donald A., 263,213, Cl. D12-209.000.
H. J. Langen & Sons Limited: *See—*
Langen, Marinus J. M.; and Strauss, Edgars H., 263,210, Cl. D34-24.000.
Haag, John J., Sr., to Ball Corporation. Packaging container or the like. 263,203, 3-2-82, Cl. D9-370.000.
Harrington, Thomas J. Carrying case for wine bottles and glasses. 263,176, 3-2-82, Cl. D3-71.000.
Harris, Robert D. Aerial spinning toy. 263,247, 3-2-82, Cl. D21-82.000.
Herbst, Walter B., to Steiner Corporation. Towel dispenser. 263,180, 3-2-82, Cl. D6-96.000.
Hermann, Hugo. Box. 263,202, 3-2-82, Cl. D9-307.000.
Herr, Nicholas G., to Xenika, Inc. Head rest. 263,190, 3-2-82, Cl. D6-201.000.
HEWI, Heinrich Wilke GmbH: *See—*
Scholl, Winfried, 263,185, Cl. D6-134.000.
Hiraishi, Etsuo; and Sakamoto, Masakazu, to Ryobi, Ltd. Printing machine. 263,242, 3-2-82, Cl. D18-13.000.
Hisano, Yoichi; Okada, Takao; Nakajima, Iwao; and Mishiro, Benito, to Matsushita Electric Industrial Co., Ltd. Combined cassette recorder and radio receiver. 263,221, 3-2-82, Cl. D14-5.000.
Hodlewsky, William G.: *See—*
Brooks, Arthur J.; Hodlewsky, William G.; and Schroeder, Roger H., 263,211, Cl. D34-29.000.
Hodson, Donald R.: *See—*
Nitz, Frederick P.; Passi, Paul J.; Hodson, Donald R.; and Davis, Donald E., 263,228, Cl. D15-5.000.
Nitz, Frederick P.; Passi, Paul J.; Hodson, Donald R.; and Davis, Donald E., 263,229, Cl. D15-5.000.
Nitz, Frederick P.; Passi, Paul J.; Hodson, Donald R.; and Davis, Donald E., 263,230, Cl. D15-5.000.
Nitz, Frederick P.; Passi, Paul J.; Hodson, Donald R.; and Davis, Donald F., 263,231, Cl. D15-5.000.
Honeywell Information Systems Inc.: *See—*
Driscoll, Edward K., 263,222, Cl. D14-11.000.
Horsting, John J., to Bendix Corporation, The. End frame for a servomotor. 263,214, 3-2-82, Cl. D13-1.000.
Horsting, John J., to Bendix Corporation, The. End frame for a servomotor. 263,215, 3-2-82, Cl. D13-1.000.
IMS Limited: *See—*
Ogle, Robert W., 263,254, Cl. D24-99.000.
Jordan Concepts, Inc.: *See—*
Jordan, John S., 263,225, Cl. D14-60.000.
Jordan, John S., to Jordan Concepts, Inc. Decorative shell cover for telephone. 263,225, 3-2-82, Cl. D14-60.000.
Kabushiki Kaisha Sano Seisakusho: *See—*
Sano, Toshio, 263,193, Cl. D7-97.000.
Kakimoto, Masakazu, to Ushio Air Tool Co., Ltd. Dental handpiece. 263,252, 3-2-82, Cl. D24-12.000.
Kauffman, William E., to Whitehall Corporation. Housing for an arc suppressor. 263,217, 3-2-82, Cl. D13-11.000.
Kauffman, William E., to Whitehall Corporation. Housing for an arc suppressor. 263,218, 3-2-82, Cl. D13-11.000.
Kelly, Roger L., to American Home Products Corporation. Can opener. 263,197, 3-2-82, Cl. D8-39.000.
Kennedy, Gary W. Bolt and nut sizer. 263,205, 3-2-82, Cl. D10-64.000.
Ketcham & McDougall, Inc.: *See—*
Laughlin, Clayton A., 263,244, Cl. D19-77.000.
Kurokawa, Koya; Arai, Noriyuki; Takahashi, Hideo; and Saeki, Taisuke, to Matsushita Electric Industrial Co., Ltd. Video tape recorder tuner. 263,220, 3-2-82, Cl. D14-2.000.
Kurokawa, Koya; Arai, Noriyuki; Takahashi, Hideo; and Saeki, Taisuke, to Matsushita Electric Industrial Co., Ltd. Video tape recorder controller. 263,223, 3-2-82, Cl. D14-02.000.
LaFrance Corporation: *See—*
Peroni, Peter A., 263,224, Cl. D14-114.000.
Langen, Marinus J. M.; and Strauss, Edgars H., to H. J. Langen & Sons Limited. Dolly for transporting coiled goods. 263,210, 3-2-82, Cl. D34-24.000.
Larson, Kenneth W.: *See—*
Bickley, Robert H.; Duddles, Allen L.; Skalka, Robert J.; Rezek, John R.; and Larson, Kenneth W., 263,207, Cl. D10-80.000.
Lash, Donald W., deceased (by Lash, Gertrude), to Lash, Gertrude. Stand for vertically supporting a roll of paper. 263,179, 3-2-82, Cl. D6-85.000.
Lash, Gertrude: *See—*
Lash, Donald W., deceased, 263,179, Cl. D6-85.000.
Lash, Donald W., deceased, 263,179, Cl. D6-85.000.
Laughlin, Clayton A., to Ketcham & McDougall, Inc. Base for a desk set. 263,244, 3-2-82, Cl. D19-77.000.
Laurenzi, Richard F. Hanging shelf. 263,183, 3-2-82, Cl. D6-113.000.
Lazzeroni, Edward J., to Miller Tilt-Top Trailer, Inc. Flat bed equipment trailer. 263,238, 3-2-82, Cl. D12-101.000.
Lee, David. Combined vehicle elevating roof and enclosure unit. 263,212, 3-2-82, Cl. D12-156.000.
Lee, Kwong-Yu R. Foil handle. 263,251, 3-2-82, Cl. D22-1.000.
LeVan, Kenneth R., to Corning Glass Works. Support stand for dishes or the like. 263,192, 3-2-82, Cl. D7-39.000.
Lockie, Richard H. Clamp and jig combination for engraving. 263,199, 3-2-82, Cl. D8-71.000.
Maher, Frank, to Cyborex Laboratories, Inc. Protective ventilated panel for electrical and electronic components. 263,216, 3-2-82, Cl. D13-4.000.
Manderfield, Ellen B., to General Mills, Inc. Spoon or similar article. 263,195, 3-2-82, Cl. D7-137.000.
Matsushita Electric Industrial Co., Ltd.: *See—*
Akita, Tsugio, 263,235, Cl. D32-22.000.
Hisano, Yoichi; Okada, Takao; Nakajima, Iwao; and Mishiro, Benito, 263,221, Cl. D14-5.000.
Kurokawa, Koya; Arai, Noriyuki; Takahashi, Hideo; and Saeki, Taisuke, 263,220, Cl. D14-2.000.
Kurokawa, Koya; Arai, Noriyuki; Takahashi, Hideo; and Saeki, Taisuke, 263,223, Cl. D14-02.000.
Ueda, Yoshiaki, 263,236, Cl. D32-32.000.
Matt, Donald A.: *See—*
Blanchard, Russell O.; Guzek, Joseph; and Matt, Donald A., 263,213, Cl. D12-209.000.
McAuliffe, Anthony P. Water-ski handle. 263,250, 3-2-82, Cl. D21-230.000.
Meehan, John J., III. Thread spool wall rack. 263,184, 3-2-82, Cl. D6-130.000.
Miller Tilt-Top Trailer, Inc.: *See—*
Lazzeroni, Edward J., 263,238, Cl. D12-101.000.
Mishiro, Benito: *See—*
Hisano, Yoichi; Okada, Takao; Nakajima, Iwao; and Mishiro, Benito, 263,221, Cl. D14-5.000.
Moore, Joseph W. Taco holder. 263,191, 3-2-82, Cl. D7-37.000.
Morse, Frederick R. Roofing tile. 263,256, 3-2-82, Cl. D25-96.000.
Motor Wheel Corporation: *See—*
Blanchard, Russell O.; Guzek, Joseph; and Matt, Donald A., 263,213, Cl. D12-209.000.
Motorola Inc.: *See—*
Bickley, Robert H.; Duddles, Allen L.; Skalka, Robert J.; Rezek, John R.; and Larson, Kenneth W., 263,207, Cl. D10-80.000.
Nakajima, Iwao: *See—*
Hisano, Yoichi; Okada, Takao; Nakajima, Iwao; and Mishiro, Benito, 263,221, Cl. D14-5.000.
Nitz, Frederick P.; Passi, Paul J.; Hodson, Donald R.; and Davis, Donald E., to Rockwell International Corporation. Flywheel. 263,228, 3-2-82, Cl. D15-5.000.
Nitz, Frederick P.; Passi, Paul J.; Hodson, Donald R.; and Davis, Donald E., to Rockwell International Corporation. Flywheel. 263,229, 3-2-82, Cl. D15-5.000.
Nitz, Frederick P.; Passi, Paul J.; Hodson, Donald R.; and Davis, Donald E., to Rockwell International Corporation. Flywheel. 263,230, 3-2-82, Cl. D15-5.000.
Nitz, Frederick P.; Passi, Paul J.; Hodson, Donald R.; and Davis, Donald F., to Rockwell International Corporation. Flywheel. 263,231, 3-2-82, Cl. D15-5.000.
Northern Telecom Limited: *See—*
Read, Clifford D., 263,208, Cl. D10-80.000.
Ogle, Robert W., to IMS Limited. Intravenous supply container support or the like. 263,254, 3-2-82, Cl. D24-99.000.
Okada, Takao: *See—*
Hisano, Yoichi; Okada, Takao; Nakajima, Iwao; and Mishiro, Benito, 263,221, Cl. D14-5.000.
Passi, Paul J.: *See—*
Nitz, Frederick P.; Passi, Paul J.; Hodson, Donald R.; and Davis, Donald E., 263,228, Cl. D15-5.000.
Nitz, Frederick P.; Passi, Paul J.; Hodson, Donald R.; and Davis, Donald E., 263,229, Cl. D15-5.000.
Nitz, Frederick P.; Passi, Paul J.; Hodson, Donald R.; and Davis, Donald E., 263,230, Cl. D15-5.000.
Nitz, Frederick P.; Passi, Paul J.; Hodson, Donald R.; and Davis, Donald F., 263,231, Cl. D15-5.000.
Peroni, Peter A., to LaFrance Corporation. Side panel for readily disassembled instrument housing. 263,224, 3-2-82, Cl. D14-114.000.
Peterson, Paul D. Planter. 263,187, 3-2-82, Cl. D6-183.000.
Polliit, James K. Simulative toy truck. 263,246, 3-2-82, Cl. D21-73.000.
Precision Stampings, Inc.: *See—*
Viets, Herta, 263,219, Cl. D13-24.000.
Press, Louis H. Braided lace keyholder. 263,175, 3-2-82, Cl. D3-65.000.
Qualidux Industrial Company Limited: *See—*
Ting, Dennis H., 263,241, Cl. D16-17.000.
Read, Clifford D., to Northern Telecom Limited. Electrical test set housing member. 263,208, 3-2-82, Cl. D10-80.000.
Rehnmark, Stig L., to Anaren Microwave, Incorporated. Antenna. 263,226, 3-2-82, Cl. D14-87.000.
Rexnord Inc.: *See—*
Brooks, Arthur J.; Hodlewsky, William G.; and Schroeder, Roger H., 263,211, Cl. D34-29.000.
Reynolds, Clarence W. Combined hearing aid volume control knob and adapter ring. 263,253, 3-2-82, Cl. D24-35.000.

Rezek, John R.: *See*—
Bickley, Robert H.; Duddles, Allen L.; Skalka, Robert J.; Rezek, John R.; and Larson, Kenneth W., 263,207, Cl. D10-80.000.
Rockholt, Carl N.; and Spurgin, Everett L. Angle finder. 263,206, 3-2-82, Cl. D10-65.000.
Rockwell International Corporation: *See*—
Nitz, Frederick P.; Passi, Paul J.; Hodson, Donald R.; and Davis, Donald E., 263,228, Cl. D15-5.000.
Nitz, Frederick P.; Passi, Paul J.; Hodson, Donald R.; and Davis, Donald E., 263,229, Cl. D15-5.000.
Nitz, Frederick P.; Passi, Paul J.; Hodson, Donald R.; and Davis, Donald E., 263,230, Cl. D15-5.000.
Nitz, Frederick P.; Passi, Paul J.; Hodson, Donald R.; and Davis, Donald F., 263,231, Cl. D15-5.000.
Rule, Robert J., to W. H. Brine Company. Lacrosse stick head. 263,249, 3-2-82, Cl. D21-210.000.
Ryobi, Ltd.: *See*—
Hiraishi, Etsuo; and Sakamoto, Masakazu, 263,242, Cl. D18-13.000.
Saeki, Taisuke: *See*—
Kurokawa, Koya; Arai, Noriyuki; Takahashi, Hideo; and Saeki, Taisuke, 263,220, Cl. D14-2.000.
Kurokawa, Koya; Arai, Noriyuki; Takahashi, Hideo; and Saeki, Taisuke, 263,223, Cl. D14-02.000.
Sakamoto, Masakazu: *See*—
Hiraishi, Etsuo; and Sakamoto, Masakazu, 263,242, Cl. D18-13.000.
Sano, Toshio, to Kabushiki Kaisha Sano Seisakusho. Cooking pot. 263,193, 3-2-82, Cl. D7-97.000.
Scholl, Winfried, to HEWI, Heinrich Wilke GmbH. Combined mirror and shelf unit. 263,185, 3-2-82, Cl. D6-134.000.
Schroeder, Roger H.: *See*—
Brooks, Arthur J.; Hodlewsky, William G.; and Schroeder, Roger H., 263,211, Cl. D34-29.000.
Schultes, Herbert; and Segers, Hermann R., to AGFA-Gevaert AG. Photographic flash camera. 263,240, 3-2-82, Cl. D16-6.000.
Schwartz, Larry A. Barbecue grill. 263,194, 3-2-82, Cl. D7-109.000.
Segers, Hermann R.: *See*—
Schultes, Herbert; and Segers, Hermann R., 263,240, Cl. D16-6.000.
Shurtz, Earl J. Thermostatically controlled portable water cooler. 263,239, 3-2-82, Cl. D15-118.000.
Skalka, Robert J.: *See*—
Bickley, Robert H.; Duddles, Allen L.; Skalka, Robert J.; Rezek, John R.; and Larson, Kenneth W., 263,207, Cl. D10-80.000.
Spurgin, Everett L.: *See*—
Rockholt, Carl N.; and Spurgin, Everett L., 263,206, Cl. D10-65.000.
Steiner Corporation: *See*—
Herbst, Walter B., 263,180, Cl. D6-96.000.
Strauss, Edgars H.: *See*—
Langen, Marinus J. M.; and Strauss, Edgars H., 263,210, Cl. D34-24.000.
Takahashi, Hideo: *See*—
Kurokawa, Koya; Arai, Noriyuki; Takahashi, Hideo; and Saeki, Taisuke, 263,220, Cl. D14-2.000.
Kurokawa, Koya; Arai, Noriyuki; Takahashi, Hideo; and Saeki, Taisuke, 263,223, Cl. D14-02.000.
Thompson, Bruce R., to UPL Group Limited. Toilet paper roll holder. 263,181, 3-2-82, Cl. D6-97.000.
Thompson, Bruce R., to UPL Group Limited. Towel ring. 263,182, 3-2-82, Cl. D6-99.000.
Thomson, Ernest F., to Duracell International Inc. Fluorescent lantern. 263,257, 3-2-82, Cl. D26-42.000.
Ting, Dennis H., to Qualidux Industrial Company Limited. Film viewer. 263,241, 3-2-82, Cl. D16-17.000.
UARCO Incorporated: *See*—
Alger, Andrew L., 263,227, Cl. D14-110.000.
Ueda, Yoshiaki, to Matsushita Electric Industrial Co., Ltd. Vacuum cleaner nozzle. 263,236, 3-2-82, Cl. D32-32.000.
UPL Group Limited: *See*—
Thompson, Bruce R., 263,181, Cl. D6-97.000.
Thompson, Bruce R., 263,182, Cl. D6-99.000.
Ushio Air Tool Co., Ltd.: *See*—
Kakimoto, Masakazu, 263,252, Cl. D24-12.000.
van der Lely, Cornelis. Cultivator tine. 263,233, 3-2-82, Cl. D15-29.000.
Van Linden, Betty J.: *See*—
Van Linden, James E.; and Van Linden, Betty J., 263,178, Cl. D6-2.000.
Van Linden, James E.; and Van Linden, Betty J., to Daily Prayer Company. Combined prayer bench and cabinet. 263,178, 3-2-82, Cl. D6-2.000.
Vaughn, Clarence. Vacuum cleaner. 263,234, 3-2-82, Cl. D32-21.000.
Viets, Herta, to Precision Stampings, Inc. Electrical contact pin. 263,219, 3-2-82, Cl. D13-24.000.
W. H. Brine Company: *See*—
Rule, Robert J., 263,249, Cl. D21-210.000.
Whitehall Corporation: *See*—
Kauffman, William E., 263,217, Cl. D13-11.000.
Kauffman, William E., 263,218, Cl. D13-11.000.
Williams, Annette. Jewelry cabinet. 263,186, 3-2-82, Cl. D6-163.000.
Wolverine World Wide, Inc.: *See*—
Getter, Byron J., 263,259, Cl. D30-99.000.
Xenika, Inc.: *See*—
Herr, Nicholas G., 263,190, Cl. D6-201.000.
Zelco Industries, Inc.: *See*—
Zeller, Noel E., 263,258, Cl. D26-49.000.
Zeller, Noel E., to Zelco Industries, Inc. Flash light. 263,258, 3-2-82, Cl. D26-49.000.
Zima, Miroslav M. Building. 263,255, 3-2-82, Cl. D25-26.000.

LIST OF DEFENSIVE PUBLICATIONS

APPLICANTS TO WHOM

DEFENSIVE PUBLICATIONS WERE ISSUED ON THE 2ND DAY OF MARCH, 1982

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

Lau, Philip T. S. Cyan dye-forming couplers. T101,601, 3-2-82, Cl. 568-716.000.

LIST OF DEFENSIVE PUBLICATIONS

ARRANGED BY NAME

DEFENSIVE PUBLICATIONS ISSUED ON THE 2ND DAY OF MARCH, 1982

CLASSIFICATION OF PATENTS

ISSUED MARCH 2, 1982

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

2 4,317,237
12 4,317,238
411 4,317,239
436 4,317,240

CLASS 3

36 4,317,241

CLASS 4

213 4,317,242
490 4,317,243

CLASS 5

449 4,317,244
497 4,317,245

CLASS 13

18 C 4,317,951

CLASS 15

83 4,317,246
104.3 SN 4,317,247
145 4,317,248
213 4,317,249
244 R 4,317,250
250.41 4,317,251
320 4,317,252
390 4,317,253

CLASS 16

61 4,317,254
102 4,317,255
354 Re.30,873

CLASS 17

1 R 4,317,256
21 4,317,257
24 4,317,258
32 4,317,259

CLASS 19

107 4,317,260
265 4,317,261

CLASS 24

16 PB 4,317,262
230 AT 4,317,263

CLASS 29

8 4,317,264
132 4,317,265
148.4 A 4,317,266
156.7 B 4,317,267
157.3 AH 4,317,268
157.3 R 4,317,269
447 4,317,270
527.6 4,317,271
571 4,317,272
4,317,273
4,317,274
4,317,275
4,317,276
860 4,317,277
878 4,317,278

CLASS 30

90.1 4,317,279
92 4,317,280
120.2 4,317,281
122 4,317,282
164.9 4,317,283
340 4,317,284
371 4,317,285

CLASS 33

1 A 4,317,286
24 R 4,317,287
265 4,317,288
498 4,317,289

CLASS 34

86 4,317,290
103 4,317,291

CLASS 36

9 R 4,317,292
43 4,317,293
100 4,317,294
117 4,317,295
121 4,317,296
4,317,297

CLASS 37

41 4,317,298
141 T 4,317,299
142 R 4,317,300

CLASS 38

102 4,317,301

CLASS 40

549 4,317,302
564 4,317,303

CLASS 42

1 ST 4,317,304

CLASS 43

42.24 4,317,305

CLASS 44

66 4,317,657

CLASS 46

26 4,317,306
210 4,317,307

CLASS 47

1.1 4,317,308
32 4,317,309
57.6 4,317,310
66 4,317,311

CLASS 48

61 4,317,658
209 4,317,659

CLASS 49

220 4,317,312

CLASS 51

163.2 4,317,313
177 4,317,314
295 4,317,660

CLASS 52

2 4,317,315
93 4,317,316
224 4,317,317
667 4,317,318

CLASS 53

76 4,317,319
374 4,317,320
399 4,317,322
426 4,317,321
563 4,317,323

CLASS 55

131 4,317,661
392 4,317,662
413 4,317,663
434 4,317,664

CLASS 56

11.3 4,317,324
11.6 4,317,325
14.6 4,317,326
396 4,317,327

CLASS 57

59 4,317,328
294 4,317,329

CLASS 60

398 4,317,330
436 4,317,331
547 R 4,317,332
649 4,317,333

CLASS 62

63 4,317,665
183 4,317,334
199 4,317,335
514 R 4,317,336

CLASS 63

3 4,317,337

CLASS 64

7 4,317,338
11 R 4,317,339
17 A 4,317,340
4,317,341

CLASS 65

2 4,317,666
27 4,317,667
29 4,317,668
135 4,317,669

CLASS 66

120 4,317,342

CLASS 68

23.7 4,317,343

CLASS 70

55 4,317,344
170 4,317,345
238 4,317,346
366 4,317,347

CLASS 71

6 4,317,670
9 4,317,671
27 4,317,672
95 4,317,673
111 4,317,674

CLASS 72

62 4,317,348
142 4,317,349
177 4,317,350
186 4,317,351
255 4,317,352
299 4,317,353
339 4,317,354
342 4,317,355
355 4,317,356
438 4,317,357
448 4,317,358
454 4,317,359

CLASS 73

15 B 4,317,360
30 4,317,361
37 4,317,362
64.1 4,317,363
117.3 4,317,364
204 4,317,365
339 A 4,317,366
362 AR 4,317,367
587 4,317,368
607 4,317,369
620 4,317,370
650 4,317,371
703 4,317,372
787 4,317,373
861.53 4,317,374
861.55 4,317,375
4,317,376
862.42 4,317,377
863.01 4,317,378
863.12 4,317,379
864.56 4,317,380

CLASS 74

10.33 4,317,381
25 4,317,382
110 4,317,383
424.8 A 4,317,384
436 4,317,385
467 4,317,386
493 4,317,387
574 4,317,388
689 4,317,389

CLASS 75

0.5 BA 4,317,675
5 4,317,676
43 4,317,677
58 4,317,678
93 E 4,317,679
134 S 4,317,680

CLASS 81

3.2 4,317,390
9.51 4,317,391
63.1 4,317,392
177 A 4,317,393

CLASS 82

2.5 4,317,394
34 D 4,317,395
36 A 4,317,396

CLASS 83

35 4,317,397
156 4,317,398
237 4,317,399
820 4,317,400
856 4,317,401

CLASS 84

291 4,317,402
313 4,317,403
474 4,317,404

CLASS 89

37 G 4,317,405

CLASS 91

39 4,317,406

CLASS 92

241 4,317,407
4,317,408
244 4,317,409

CLASS 99

277.2 4,317,410
623 4,317,411

CLASS 101

93.01 4,317,412

CLASS 102

275.9 4,317,413
406 4,317,414

CLASS 105

378 4,317,415

CLASS 106

85 4,317,681
288 B 4,317,682
292 4,317,683
316 4,317,684

CLASS 108

157 4,317,416

CLASS 110

211 4,317,417
331 4,317,418

CLASS 112

266.2 4,317,419

CLASS 114

230 4,317,421
270 4,317,422
297 4,317,423

CLASS 116

56 4,317,424

CLASS 118

33 4,317,425
418 4,317,426
503 4,317,427
623 4,317,428

CLASS 119

2 4,317,429
52 AF 4,317,430
158 4,317,431

CLASS 123

1 R 4,317,432
90.51 4,317,433
145 A 4,317,434
179 J 4,317,435
188 P 4,317,436
414 4,317,437
432 4,317,438
563 4,317,439
590 4,317,440

CLASS 126

41 R 4,317,441
121 4,317,442
429 4,317,443
438 4,317,444

CLASS 128

214.4 4,317,445
218 R 4,317,446
260 4,317,447
272.3 4,317,448
287 4,317,449
303.13 4,317,450
325 4,317,451
350 R 4,317,452
719 4,317,453
759 4,317,454
765 4,317,455
766 4,317,456
783 4,317,457
784 4,317,458
785 4,317,459

CLASS 131

334 4,317,460

CLASS 132

7 Re.30,874
40 4,317,461
45 R 4,317,462
84 R 4,317,463
113 4,317,464
149 4,317,465

CLASS 134

2 4,317,685

CLASS 137

70 4,317,470
115 4,317,466
493 4,317,467
540 4,317,468
625.65 4,317,469
798 4,317,471

CLASS 138

30 4,317,472
45 4,317,473

CLASS 141

1 4,317,474
95 4,317,475

CLASS 144

194 4,317,476

CLASS 148

1.5 4,317,686
16.5 4,317,687
24 4,317,688
171 4,317,689
187 4,317,690

CLASS 149

2 4,317,691

CLASS 150

1.5 B 4,317,477
10 4,317,478

CLASS 152

353 R 4,317,479

CLASS 156

97 4,317,692
175 4,317,693
256 4,317,694
353 4,317,695
523 4,317,696
583.1 4,317,697
626 4,317,698
629 4,317,699
652 4,317,700

CLASS 160

23 R 4,317,480
84 R 4,317,481

CLASS 162

234 4,317,701

CLASS 164

454 4,317,482

CLASS 165

81 4,317,483
134 R 4,317,484

CLASS 166

216 4,317,485
250 4,317,486
305 R 4,317,487
351 4,317,488

CLASS 172

400 4,317,489

CLASS 174

15 BH 4,317,952
21 R 4,317,953
53 4,317,954
126 CP 4,317,955

CLASS 175

20 4,317,490
57 4,317,491
79 4,317,492
87 4,317,493
88 4,317,494

CLASS 177

157 4,317,495
163 4,317,496

CLASS 178

18 4,317,956
22.08 4,317,957

CLASS 179

1 G 4,317,958
1 VC 4,317,959
18 BC 4,317,960
4,317,961
18 ES 4,317,962
77 4,317,963
81 R 4,317,964
115 V 4,317,966
115.5 R 4,317,965
175.3 R 4,317,967

CLASS 180

68.5 4,317,497
70 R 4,317,498
133 4,317,499
273 4,317,500

CLASS 181

121 4,317,501
280 4,317,502
290 4,317,503

CLASS 182

67 4,317,504

CLASS 187

17 4,317,505
29 R 4,317,506

CLASS 188

5 4,317,507
218 A 4,317,508

CLASS 192

4 A 4,317,509
48.3 4,317,510
56 R 4,317,511
85 AA 4,317,512
105 A 4,317,513

CLASS 198

649 4,317,514

CLASS 200

5 R 4,317,968
52 R 4,317,969
61.43 4,317,970
83 J 4,317,971
153 P 4,317,973
153 S 4,317,972
330 4,317,974

CLASS 201

1 4,317,703

CLASS 204

1 R 4,317,704
1 T 4,317,705
198 4,317,706
213 4,317,707
228 4,317,708
268 4,317,709
299 R 4,317,710

CLASS 206

315 R 4,317,515
320 4,317,516
577 4,317,519
597 4,317,517
626 4,317,518

CLASS 208

8 LE 4,317,711
46 4,317,712
113 4,317,713

CLASS 209

3.1 4,317,520
44 4,317,714
167 4,317,715
211 4,317,716

212 4,317,717
215 4,317,718
223 R 4,317,719
558 4,317,521

CLASS 210

86 4,317,720
120 4,317,721
149 4,317,722
202 4,317,723
225 4,317,724
235 4,317,725
236 4,317,726
315 4,317,727
370 4,317,728
500.2 4,317,729
695 4,317,730
741 4,317,731
744 4,317,732
752 4,317,733
780 4,317,734

CLASS 211

113 4,317,522
187 4,317,523

CLASS 212

146 4,317,524

CLASS 215

1 C 4,317,525
217 4,317,526

CLASS 219

10.49 R 4,317,975
10.55 B 4,317,977
10.55 F 4,317,976
10.71 4,317,978
10.77 4,317,979
117.1 4,317,980
121 EA 4,317,981
4,317,983
121 EN 4,317,982
121 PU 4,317,984
210 4,317,985
231 4,317,986
506 4,317,987

CLASS 220

4 F 4,317,527
224 4,317,528
263 Re.30,875

CLASS 222

146 HE 4,317,529
309 4,317,530
321 4,317,531
505 4,317,532

CLASS 224

42.21 4,317,533
328 4,317,534

CLASS 227

19 4,317,535

CLASS 229

34 R 4,317,536
42 4,317,537
72 4,317,538

CLASS 235

92 DN 4,317,989
92 MT 4,317,988
494 4,317,990

CLASS 239

1 4,317,539
85 4,317,540
88 4,317,541
585 4,317,542

CLASS 241

16 4,317,543
57 4,317,544

CLASS 242

18 A 4,317,545
55 4,317,546
55.3 4,317,547
125.2 4,317,548
157 R 4,317,549

CLASS 248

95 4,317,550
141 4,317,551
168 4,317,552
171 4,317,553
205 A 4,317,554
467 4,317,555
602 4,317,556

CLASS 250

201 4,317,991
221 4,317,992
270 4,317,993
275 4,317,994
288 4,317,995
302 4,317,996
308 4,317,997
347 4,317,998
413 4,317,999
455 4,318,000
483 4,318,001
492.2 4,318,002
548 4,318,003

CLASS 251

1 B 4,317,557
306 4,317,558
331 4,317,559

CLASS 252

8.55 C 4,317,735
8.75 4,317,736
28 4,317,737
47.5 4,317,738
4,317,739
49.3 4,317,740
77 4,317,741
188 4,317,742
316 4,317,743
389 A 4,317,744
428 4,317,745
435 4,317,746
469 4,317,747
472 4,317,748
519 4,317,749
4,317,750
582 4,317,751

CLASS 254

106 Re.30,876

CLASS 260

112.5 E 4,317,770
112.5 R 4,317,771
132 4,317,772
239 EP 4,317,773
239.1 4,317,774
4,317,775
244.4 4,317,776
346.75 4,317,777
4,317,778
400 4,317,779
410.6 4,317,780
465 F 4,317,781
932 4,317,782
937 4,317,783

CLASS 261

65 4,317,784
111 4,317,785
112 4,317,786
4,317,787

CLASS 264

22 4,317,788
105 4,317,789
176 F 4,317,790
297 4,317,791
504 4,317,792
521 4,317,793
559 4,317,794

CLASS 266

48 4,317,560
265 4,317,561

CLASS 269

304 4,317,562

CLASS 271

211 4,317,563
223 4,317,564
274 4,317,565

CLASS 272

118 4,317,566

CLASS 273

26 B 4,317,567
163 A 4,317,568
200 B 4,317,569
246 4,317,570
341 4,317,571
406 4,317,572

CLASS 277

113 4,317,573
160 4,317,574
227 4,317,575
235 B 4,317,576

CLASS 279

2 A 4,317,577
60 4,317,578

CLASS 280

402 4,317,579
415 R 4,317,580
644 4,317,581
751 4,317,582
804 4,317,583
4,317,584

CLASS 285

93 4,317,585
95 4,317,586
137 A 4,317,587

CLASS 290

52 4,318,004

CLASS 292

341.14 4,317,588

CLASS 296

97 D 4,317,589
176 4,317,590

CLASS 297

455 4,317,591

CLASS 298

7 4,317,592
11 4,317,593

CLASS 299

64 4,317,594
94 4,317,595

CLASS 301

1 4,317,596
63 R 4,317,597

CLASS 303

6 C 4,317,598

CLASS 307

10 AT 4,318,005
38 4,318,006
44 4,318,007
84 4,318,008
246 4,318,009
261 4,318,010
300 4,318,011
360 4,318,012
362 4,318,013
463 4,318,014
475 4,318,015

CLASS 308

187 4,317,599
188 4,317,600
202 4,317,601
207 R 4,317,602

CLASS 310

19 4,318,016
42 4,318,017
156 4,318,018
4,318,019
215 4,318,020
260 4,318,021
4,318,022
328 4,318,023

CLASS 312

9 4,317,603
97.1 4,317,604
206 4,317,605
231 4,317,606
236 4,317,607

CLASS 313

220 4,318,024
404 4,318,025
448 4,318,026

CLASS 315

15 4,318,027
111.81 4,318,028
4,318,029
4,318,030
133 4,318,031
368 4,318,032
382 4,318,033
383 4,318,034
387 4,318,035
408 4,318,036
411 4,318,037

CLASS 318

135 4,318,038

CLASS 323

273 4,318,039
312 4,318,040

CLASS 324

71 R 4,318,041
72.5 4,318,042
309 4,318,043
4,318,044

CLASS 328

18 4,318,045
39 4,318,046
112 4,318,047
155 4,318,048

CLASS 329

50 4,318,049
101 4,318,050

CLASS 330

254 4,318,051
255 4,318,052
281 4,318,053
302 4,318,054

CLASS 331

12 4,318,055
107 A 4,318,061
109 4,318,062
158 4,318,063

CLASS 333

202 4,318,064

CLASS 335

17 4,318,065

CLASS 336

70 4,318,066
90 4,318,067
100 4,318,068
192 4,318,069

CLASS 337

3 4,318,070
136 4,318,071

CLASS 338

7 4,318,072
28 4,318,073
32 H 4,318,074
162 4,318,075

CLASS 339

99 R 4,317,608
221 R 4,317,609

CLASS 340

27 NA 4,318,076
51 4,318,077
59 4,318,078
127 4,318,079
146.3 F 4,318,083
146.3 H 4,318,081
4,318,082
146.3 Q 4,318,080
309.1 4,318,084
347 AD 4,318,086
347 DA 4,318,085
365 S 4,318,087
541 4,318,088
567 4,318,089
572 4,318,090
626 4,318,091
636 4,318,092
644 4,318,093
657 4,318,094
706 4,318,095
4,318,096
728 4,318,097
764 4,318,098

CLASS 343

5 CF 4,318,101
5 SW 4,318,099
5 W 4,318,100
12 A 4,318,102
18 E 4,318,103
100 LE 4,318,104
103 4,318,105
124 4,318,106
700 MS 4,318,107
753 4,318,108
806 4,318,109

CLASS 346

32 4,318,110
75 4,318,111
135.1 4,318,112
136 4,318,113
140 R 4,318,114

CLASS 350

3.77 4,317,610
6.6 4,317,611
83 4,317,612
89 4,317,613
96.16 4,317,614
96.32 4,317,615
96.34 4,317,616
97 4,317,617
120 4,317,618

CLASS 353

25 4,317,619

CLASS 354

33 4,317,620
4,317,621
34 4,317,622
60 A 4,317,623
139 4,317,624
145 4,317,625
180 4,317,626
286 4,317,627
288 4,317,628

CLASS 355

24 4,317,629
50 4,317,630

CLASS 356

73.1 4,317,631
241 4,317,632
371 4,317,633

CLASS 357

30 4,318,115
42 4,318,117
54 4,318,118

CLASS 358

8 4,318,119
12 4,318,120
22 4,318,121
41 4,318,122
43 4,318,123
51 4,318,124
4,318,125
121 4,318,126
141 4,318,127
147 4,318,128
4,318,129
174 4,318,130
191.1 4,318,131
210 4,318,132
228 4,318,133
229 4,318,134
287 4,318,135
294

CLASS 360

17 4,318,136
32 4,318,137
69 4,318,138
71 4,318,139
73 4,318,140
77 4,318,141
4,318,142
84 4,318,143
99 4,318,144
106 4,318,145
107 4,318,146
119 4,318,147
127 4,318,148

CLASS 361

15 4,318,149
41 4,318,150
45 4,318,151
92 4,318,152
119 4,318,153
155 4,318,154
156 4,318,155
358 4,318,156
386 4,318,157

CLASS 362

29 4,318,158
124 4,318,159
216 4,318,160
226 4,318,161
4,318,162
359 4,318,163

CLASS 363

21 4,318,164
4,318,165
26 4,318,166
41 4,318,167
56 4,318,168
123 4,318,169
133 4,318,170
138 4,318,171

CLASS 364

200 4,318,172
4,318,173
4,318,174
4,318,175
4,318,182
469 4,318,176
502 4,318,177
4,318,178
506 4,318,179
555 4,318,180
569 4,318,181
900 4,318,183
4,318,184
4,318,185

CLASS 365

8 4,318,186
4,318,187
45 4,318,188

CLASS 366

1 4,317,634

CLASS 372

47 4,318,059
50 4,318,058
57 4,318,056
70 4,318,057
4,318,060

CLASS 376

272 4,317,702

CLASS 400

124 4,317,635
208 4,317,636
240.1 4,317,637

CLASS 401

195 4,317,638
209 4,317,639

CLASS 403

36 4,317,640
347 4,317,641

CLASS 404

72 4,317,642

CLASS 405

256 4,317,643

CLASS 409

98 4,317,644

CLASS 410

94 4,317,645

CLASS 415

116 4,317,646

CLASS 417

339 4,317,647

CLASS 418

120 4,317,648

CLASS 422

62 4,317,795
95 4,317,796
119 4,317,797
144 4,317,798
249 4,317,799

CLASS 423

1 4,317,800
54 4,317,801
55 4,317,802
99 4,317,803
139 4,317,804
240 4,317,805
242 4,317,806
320 4,317,807
375 4,317,808
447.1 4,317,809

CLASS 424

12 4,317,810
89 4,317,811
116 4,317,812
130 4,317,813
4,317,814
177 4,317,815
182 4,317,816
226 4,317,817
242 4,317,818
244 4,317,819
246 4,317,820
248.54 4,317,821
4,317,823
249 4,317,822
250 4,317,824
4,317,825
258 4,317,826
263 4,317,827
4,317,828
269 4,317,829
273 R 4,317,830
4,317,831
274 4,317,832
283 4,317,833
304 4,317,834
309 4,317,835
331 4,317,836

CLASS 425

112 4,317,420
150 4,317,649

CLASS 426

3 4,317,837
5 4,317,838
96 4,317,839
100 4,317,840
239 4,317,841
302 4,317,842
656 4,317,843

CLASS 427

39 4,317,844
47 4,317,845
98 4,317,846
260 4,317,847
309 4,317,848
362 4,317,849
370 4,317,850
426 4,317,851

CLASSIFICATION OF PATENTS

CLASS 428

40	4,317,852
80	4,317,853
182	4,317,854
212	4,317,855
273	4,317,856
334	4,317,857
379	4,317,858
389	4,317,859
421	4,317,860
	4,317,861
442	4,317,862

CLASS 429

19	4,317,863
36	4,317,864
41	4,317,865
	4,317,866
42	4,317,867
82	4,317,868
128	4,317,869
161	4,317,870
179	4,317,871
190	4,317,872
197	4,317,873
213	4,317,874

CLASS 430

8	4,317,875
293	4,317,876

CLASS 434

16	4,317,650
22	4,317,651
	4,317,652
211	4,317,653
	4,317,654

CLASS 435

7	4,317,877
10	4,317,878
14	4,317,879
94	4,317,880
97	4,317,881
212	4,317,882
234	4,317,883
247	4,317,884
253	4,317,885
285	4,317,886

CLASS 440

78	4,317,655

CLASS 493

197	4,317,656

CLASS 521

38	4,317,887
79	4,317,888
107	4,317,889
159	4,317,752

CLASS 523

144	4,317,763
203	4,317,762
204	4,317,765

CLASS 524

93	4,317,759
99	4,317,768
101	4,317,766
102	4,317,767
111	4,317,760
117	4,317,769
141	4,317,761
202	4,317,758
276	4,317,755
449	4,317,764
500	4,317,895
504	4,317,753
541	4,317,757
607	4,317,756

CLASS 525

66	4,317,890
	4,317,891
194	4,317,892
328	4,317,893
455	4,317,894
501	4,317,896
501.5	4,317,754

CLASS 526

116	4,317,897
141	4,317,898

CLASS 528

14	4,317,899
59	4,317,900
139	4,317,901
337	4,317,902

CLASS 536

11	4,317,903
17 R	4,317,904

CLASS 542

413	4,317,905
426	4,317,906

CLASS 544

21	4,317,907
74	4,317,908
127	4,317,909
154	4,317,910
222	4,317,911

CLASS 546

199	4,317,912
345	4,317,913

CLASS 548

239	4,317,914

CLASS 549

68	4,317,915

CLASS 560

43	4,317,916
72	4,317,917

CLASS 562

406	4,317,918
414	4,317,919
440	4,317,920
444	4,317,921
461	4,317,922
487	4,317,923
	4,317,924
531	4,317,925
532	4,317,926
535	4,317,927

CLASS 564

160	4,317,928
249	4,317,929
363	4,317,930
409	4,317,931
445	4,317,932

CLASS 568

121	4,317,939
433	4,317,933
437	4,317,934
445	4,317,935
454	4,317,936
488	4,317,937
619	4,317,938
625	4,317,940
646	4,317,941
670	4,317,942
678	4,317,943
728	4,317,944
853	4,317,945
862	4,317,946
949	4,317,947

CLASS 585

329	4,317,948
458	4,317,949
852	4,317,950

CLASSIFICATION OF DESIGNS

D3—	65	263,175
	71	263,176
		263,177
D6—	2	263,178
	85	263,179
	96	263,180
	97	263,181
	99	263,182
	113	263,183
	130	263,184
	134	263,185
	163	263,186
	183	263,187
	184	263,188
	195	263,189
	201	263,190
D7—	37	263,191
	39	263,192
	97	263,193
	109	263,194
	137	263,195
	140	263,196
D8—	39	263,197
	40	263,198
	71	263,199
	333	263,200
		263,201
D9—	307	263,202
	370	263,203
	433	263,204
D10—	64	263,205
	65	263,206
	80	263,207
		263,208
	103	263,209
D12—	101	263,238
	156	263,212
	209	263,213
D13—	1	263,214
		263,215
	4	263,216
	11	263,217
		263,218
	24	263,219
D14—	2	263,220
	5	263,221
	02	263,223
	11	263,222
	60	263,225
	87	263,226
	110	263,227
	114	263,224
D15—	5	263,228
		263,229
		263,230
		263,231
		263,232
	29	263,233
	97	263,237
	118	263,239
D16—	6	263,240
	17	263,241
D18—	13	263,242
D19—	34	263,243
	77	263,244
D21—	23	263,245
	73	263,246
	82	263,247
	210	263,248
		263,249
	230	263,250
D22—	1	263,251
D24—	12	263,252
	35	263,253
	99	263,254
D25—	26	263,255
	96	263,256
D26—	42	263,257
	49	263,258
D30—	99	263,259
D32—	21	263,234
	22	263,235
	32	263,236
D34—	24	263,210
	29	263,211

CLASSIFICATION OF PLANTS

P.—	45	4,828

DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

568—	716	T101,601

GEOGRAPHICAL INDEX

OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 : 4,317,261
4,317,268
4,317,796
4,318,076
02 : 4,317,493
04 : 4,318,141
05 : 4,317,408
06 : 4,317,244
4,317,245
4,317,257
4,317,289
4,317,294
4,317,334
4,317,337
4,317,345
4,317,350
4,317,401
4,317,415
4,317,429
4,317,439
4,317,455
4,317,468
4,317,472
4,317,474
4,317,502
4,317,509
4,317,514
4,317,515
4,317,528
4,317,566
4,317,578
4,317,611
4,317,614
4,317,616
4,317,632
4,317,636
4,317,638
4,317,639
4,317,663
4,317,672
4,317,673
4,317,689
4,317,690
4,317,698
4,317,700
4,317,722
4,317,727
4,317,730
4,317,731
4,317,746
4,317,749
4,317,750
4,317,752
4,317,770
4,317,847
4,317,863
4,317,886
4,317,949
4,317,971
4,317,972
4,317,985
4,318,000
4,318,002
4,318,010
4,318,016
4,318,019
4,318,023
4,318,028
4,318,029
4,318,030
4,318,043
4,318,052
4,318,079
4,318,089
4,318,096
4,318,118
4,318,121
4,318,129
4,318,136
4,318,142
4,318,166
4,318,170
4,318,175
08 : 4,317,281
4,317,295
4,317,296
4,317,297
4,317,551
4,317,629
4,317,991
4,317,992
09 : 4,317,280
4,317,653
4,317,654
4,317,679
4,317,741
4,317,837
4,317,838
4,317,865
4,317,866
4,317,940
4,317,962
4,317,963
4,317,993
4,318,018
10 : 4,317,756
12 : 4,317,238
4,317,304
4,317,370
4,317,440
4,317,461
4,317,590
4,317,605
4,317,610
4,317,651
4,317,652
4,317,790
4,317,810
4,317,859
4,317,902
4,317,987
4,318,073
4,318,090
4,318,159
13 : 4,317,411
4,317,549
4,317,703
4,317,740
4,318,106
4,318,150
16 : 4,317,369
17 : Re.30,874
4,317,247
4,317,255
4,317,259
4,317,262
4,317,276
4,317,303
4,317,315
4,317,363
4,317,418
4,317,421
4,317,448
4,317,467
4,317,523
4,317,537
4,317,550
4,317,580
4,317,599
4,317,664
4,317,669
4,317,713
4,317,743
4,317,763
4,317,870
4,317,880
4,317,896
4,317,898
4,317,904
4,317,923
4,317,996
4,318,036
4,318,074
4,318,077
4,318,176
18 : 4,317,250
4,317,327
4,317,338
4,317,380
4,317,427
4,317,430
4,317,437
4,317,532
4,317,645
4,317,694
4,317,792
4,317,852
4,317,964
4,318,035
4,318,084
4,318,091
4,318,130
19 : 4,317,299
4,317,489
4,317,499
4,317,596
4,317,707
20 : 4,317,323
4,317,693
4,317,785
21 : 4,317,322
4,317,343
4,317,516
4,318,022
22 : 4,317,301
4,317,305
4,317,491
4,317,517
4,317,557
4,317,562
4,317,617
4,317,723
4,317,745
4,317,815
24 : 4,317,423
4,317,683
4,317,716
4,317,726
4,317,776
4,317,869
4,317,928
4,317,932
4,317,979
4,317,989
4,318,055
4,318,099
25 : 4,317,287
4,317,395
4,317,450
4,317,520
4,317,565
4,317,603
4,317,607
4,317,620
4,317,624
4,317,625
4,317,692
4,317,797
4,317,799
4,318,039
4,318,063
4,318,066
4,318,069
4,318,102
4,318,134
4,318,182
4,318,183
26 : 4,317,312
4,317,374
4,317,436
4,317,465
4,317,481
4,317,497
4,317,527
4,317,541
4,317,577
4,317,591
4,317,597
4,317,657
4,317,704
4,317,903
4,317,931
4,317,934
4,317,939
4,317,941
4,318,085
4,318,173
27 : 4,317,302
4,317,307
4,317,402
4,317,459
4,317,471
4,317,518
4,317,564
4,317,593
4,317,732
4,317,871
4,317,977
4,317,980
4,318,157
28 : 4,318,053
29 : 4,317,310
4,317,377
4,317,492
4,317,525
4,318,037
31 : 4,317,530
33 : 4,317,718
4,317,724
4,317,960
4,317,961
4,318,105
4,318,137
4,318,168
34 : 4,317,239
4,317,253
4,317,266
4,317,373
4,317,419
4,317,422
4,317,446
4,317,447
4,317,451
4,317,456
4,317,473
4,317,487
4,317,506
4,317,507
4,317,604
4,317,649
4,317,667
4,317,681
4,317,712
4,317,737
4,317,744
4,317,751
4,317,765
4,317,798
4,317,801
4,317,826
4,317,839
4,317,846
4,317,854
4,317,893
4,317,895
4,317,906
4,317,910
4,317,915

4,317,954	4,317,678	4,317,387	4,317,735	4,317,922	4,318,008
4,317,956	4,317,761	4,317,388	4,317,738	4,317,935	4,318,013
4,317,988	4,317,774	4,317,442	4,317,739	4,317,973	4,318,014
4,318,015	4,317,805	4,317,469	4,317,758	4,318,026	4,318,031
4,318,045	4,317,827	4,317,478	4,317,772	4,318,027	4,318,033
4,318,051	4,317,840	4,317,479	4,317,795	4,318,072	4,318,187
4,318,087	4,317,842	4,317,494	4,317,948	4,318,125	49 : 4,317,921
4,318,109	4,317,874	4,317,498	4,318,178	4,318,156	4,318,184
4,318,126	4,317,877	4,317,510	41 : 4,317,300	4,318,163	51 : 4,317,344
4,318,154	4,317,892	4,317,522	4,317,398	44 : 4,317,328	4,317,585
4,318,160	4,317,899	4,317,560	4,317,441	4,317,452	4,317,643
4,318,186	4,317,909	4,317,589	4,318,108	4,317,986	4,317,697
35 : 4,317,612	4,317,944	4,317,601	42 : Re.30,875	4,318,094	4,317,736
4,318,056	4,317,946	4,317,662	4,317,249	45 : 4,317,449	4,317,885
4,318,057	4,317,952	4,317,685	4,317,368	4,317,568	4,317,957
4,318,060	4,317,967	4,317,695	4,317,376	47 : 4,317,271	53 : 4,317,424
36 : 4,317,264	4,317,997	4,317,708	4,317,392	4,317,555	4,317,480
4,317,282	4,318,025	4,317,720	4,317,547	4,318,071	4,317,966
4,317,283	4,318,048	4,317,747	4,317,552	48 : 4,317,272	54 : 4,317,284
4,317,311	4,318,088	4,317,778	4,317,554	4,317,273	4,317,309
4,317,318	4,318,093	4,317,779	4,317,571	4,317,275	4,317,592
4,317,367	4,318,111	4,317,809	4,317,575	4,317,279	55 : 4,317,265
4,317,371	4,318,120	4,317,817	4,317,609	4,317,357	4,317,317
4,317,393	4,318,135	4,317,818	4,317,640	4,317,362	4,317,320
4,317,404	4,318,153	4,317,901	4,317,659	4,317,375	4,317,325
4,317,412	4,318,165	4,317,933	4,317,680	4,317,378	4,317,391
4,317,416	4,318,179	4,317,978	4,317,687	4,317,384	4,317,475
4,317,417	37 : 4,317,258	4,317,994	4,317,696	4,317,407	4,317,476
4,317,426	4,317,277	4,318,005	4,317,711	4,317,409	4,317,500
4,317,454	4,317,536	4,318,103	4,317,764	4,317,445	4,317,535
4,317,464	4,317,953	4,318,114	4,317,811	4,317,485	4,317,556
4,317,519	4,318,122	4,318,152	4,317,812	4,317,490	4,317,569
4,317,526	39 : 4,317,246	4,318,155	4,317,822	4,317,539	4,317,655
4,317,538	4,317,252	4,318,161	4,317,844	4,317,927	4,317,755
4,317,600	4,317,292	4,318,162	4,317,858	4,317,936	4,317,868
4,317,606	4,317,332	40 : 4,317,330	4,317,872	4,317,938	4,317,879
4,317,622	4,317,339	4,317,353	4,317,889	4,317,943	4,318,092
4,317,626	4,317,346	4,317,470	4,317,894	4,317,950	56 : 4,317,496
4,317,641	4,317,354	4,317,486			

DESIGN PATENTS

01 : 263,205	263,230	263,197	263,213	263,183	44 : 263,194
04 : 263,207	263,231	263,227	27 : 263,204	263,195	263,243
263,216	263,232	263,251	263,244	263,226	47 : 263,217
06 : 263,176	263,245	18 : 263,203	263,253	263,234	263,218
263,177	263,254	263,214	29 : 263,189	263,249	263,247
263,187	08 : 263,200	263,215	263,191	263,258	48 : 263,198
263,190	263,201	20 : 263,239	32 : 263,199	39 : 263,259	263,209
263,206	263,237	24 : 263,246	34 : 263,184	42 : 263,186	49 : 263,250
263,219	09 : 263,257	25 : 263,248	263,188	263,192	55 : 263,211
263,228	13 : 263,225	26 : 263,178	36 : 263,175	263,224	263,238
263,229	17 : 263,180	263,179			

PLANT PATENTS

06 : 4,828					

DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

36 : T101,601					

U.S. GOVERNMENT PRINTING OFFICE : O—1982

CHANGE OF ADDRESS FORM

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

PLEASE PRINT OR TYPE

(or) COUNTRY

Mail this form to: NEW ADDRESS

Superintendent of Documents
Government Printing Office SSOM
Washington, D.C. 20402

Attach last subscription label here.

SUBSCRIPTION ORDER FORM

SUBSCRIPTION ORDER FORM

ENTER MY SUBSCRIPTION TO:

@ $ Domestic; **@ $** Foreign.

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

PLEASE PRINT OR TYPE

(or) COUNTRY

☐ Remittance Enclosed (Make checks payable to Superintendent of Documents)

☐ Charge to my Deposit Account No

MAIL ORDER FORM TO
Superintendent of Documents
Government Printing Office
Washington, D.C. 20402

U.S. DEPARTMENT OF COMMERCE
Malcolm Baldrige, *Secretary*

PATENT AND TRADEMARK OFFICE
Gerald J. Mossinghoff, *Commissioner*